THE Soybean Digest

Official Publication

OF

THE AMERICAN SOYBEAN ASSOCIATION

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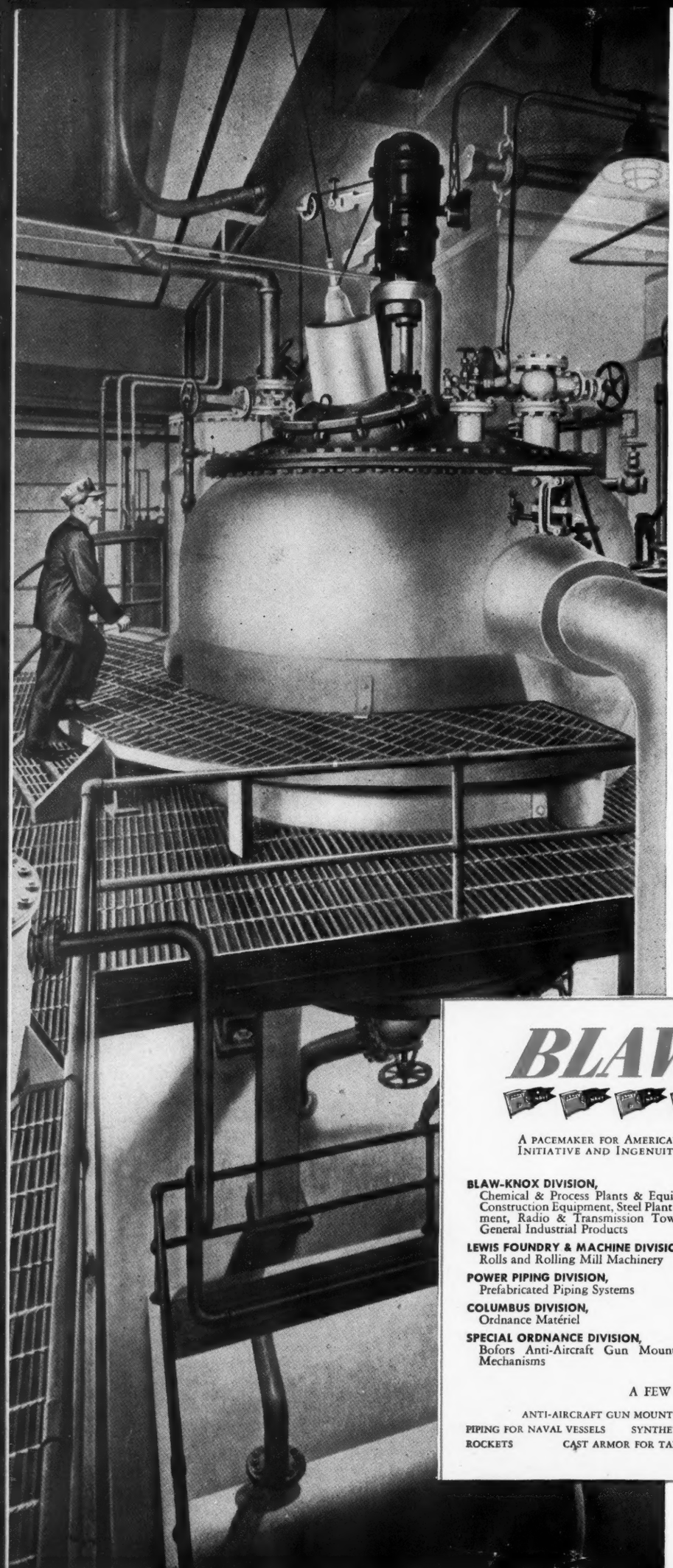

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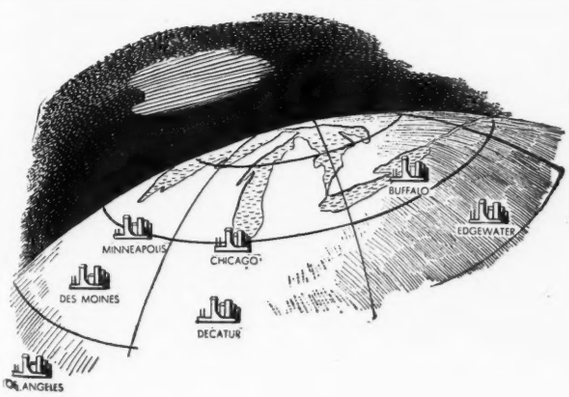

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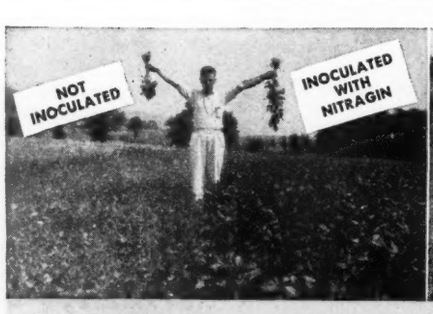

BIGGER YIELDS • Nitrogen-hungry soybeans on left (above) wasted the grower's labor and land. Soybeans inoculated with NITRAGIN (right) were a highly profitable crop.

SURER CROPS • Inoculated crop (above) had extra vigor to grow faster, crowd out weeds and make a good yield. Weeds ruined the weakling soybeans on left.

TESTED • NITRAGIN contains selected, tested strains of legume bacteria. In Nitragin greenhouse test shown above, the strain producing most nodules actually hindered growth.

THE *Soybean Digest*

REG. U. S. PAT. OFF.

GEO. M. STRAYER, Editor **KENT PELLETT, Managing Editor**

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IN THIS ISSUE

BACK THE SEVENTH WAR LOAN!

• *An urgent message from our armed forces commanders.*

TO THE AMERICAN PEOPLE:

Your sons, husbands and brothers who are standing today upon the battlefronts are fighting for more than victory in war. They are fighting for a new world of freedom and peace.

We, upon whom has been placed the responsibility of leading the American forces, appeal to you with all possible earnestness to invest in War Bonds to the fullest extent of your capacity.

Give us not only the needed implements of war, but the assurance and backing of a united people so necessary to hasten the victory and speed the return of your fighting men.

William D. Leahy
Douglas MacArthur
Ernest J. King
Dwight D. Eisenhower
Chester W. Nimitz
H. H. Arnold

THIS YEAR WE MUST FOLLOW THROUGH

Foods men in charge of supplies for the armed services are demanding the heaviest military food requirements in history for 1945. Foreign relief food needs have catapulted to figures far beyond the wildest speculation of a year ago. Civilian demands within the nation continue at record high levels — prompted by high incomes and heavy employment, coupled with shortages of meat supplies for domestic use. American agricultural production in 1945 will have to meet the greatest goal yet known for the food and fibre output of American farms.

For six successive years, working under the strain of wartime demands and with increasingly severe labor shortages, American farmers have topped the previous year's production records. The total 1944 output was over 35 percent above the average for the 1935-39 period. Mother Nature has dealt kindly with the breadbasket of the world. The physical job of producing 35 percent more food with 10 percent fewer people on farms and with machinery aging rapidly and impossible to replace, has been tremendous.

Farmers are under great strain. The average age of farm workers has moved up rapidly with the dissipation

of rural ranks by military demands. Sometimes it seems impossible to go on with the seemingly impossible job. But the time for relaxing is not yet here.

The year 1945 is not the time for cutting down on food production. Never before has it been so clear that "Food Will Win the War and Write the Peace." When we promise foodstuffs to liberated countries and cannot supply them we forfeit our best chances for the establishment of a lasting peace. American farmers will write the peace with soybeans and corn and wheat and hogs and beef and other farm crops. In 1945 we must not fail to do our part. The boys in the tanks, planes and assault boats are proving to the world that we can win the war. Those of us at home must now prove — in 1945 — that we can win the peace which is to follow.

Is Lincoln Oversold? By the spring of 1946 there should be enough Lincoln seed to plant a large share of Cornbelt soybean fields to this new variety. Indications are that a very large acreage will be planted to Lincoln.

There is no doubt that Lincoln is an outstanding variety and that its yield, oil content and general performance to date have been excellent.

Is there any danger of overdoing the swing to Lincoln?

Dr. William B. Allington, associate pathologist in the U. S. Regional Soybean Laboratory, pointed out one such danger last fall — that from disease when too few varieties are grown. Said Dr. Allington, "Lincoln, if its present performance is continued, will be planted very extensively in the territory to which it is adapted as soon as the seed is available. From a pathologist's viewpoint this is a questionable procedure, since it may provide the set-up for a widespread epidemic of disease. As far as our experience has gone it has no serious weakness as far as disease susceptibility is concerned. It is attacked by all of our common diseases but seems to be as resistant as any of our varieties. However, experience with other crops should tell us that no variety can stand up long against all comers."

Now J. E. Johnson, veteran soybeaner and past president of the American Soybean Association, has raised a warning hand in his column, "Where to?" in the April *Digest*. As Mr. Johnson points out, too much enthusiasm for other new varieties has resulted in planting them in localities and on soils where they were not adapted, with resulting disappointment.

It is just as well to go a little slow in planting even as good a variety as Lincoln until its limitations are known.

Just in Passing . . . I. C. Bradley of Allied Mills has been in on soybean processing history from the beginning . . . For a late summer pasture crop try soybeans and sudan grass . . . An article on cottonseed, which has more in common with soybeans than most of us realized, is a new departure for the *Digest*. Comments are invited . . . We can't rely on nutritional appeals to sell soy in food, believes the National Research Council.

DEVELOPED RALSOY STRAIN . . .

Ralston Purina Sells Osceola, Ark., Plant

The cottonseed processing mill and dehydrating plant of the Ralston Purina Co., at Osceola, Ark., has been sold to Lee Wilson & Co., of Wilson Ark., at a sale price of $175,000, it is announced by E. F. Johnson, manager of the soybean and oil meal division of the Purina Co.

It is understood that Wilson & Co., will continue operating the Osceola mill.

Ralston Purina Co. purchased the plant 10 years ago with the plan of developing it into a major soybean processing location. Realizing that no processing plant can operate unless the farmers in the area can produce the needed raw material at a profit, the firm spent between $10,000 and $15,000 in research and experimental work.

Two steps were necessary in order to make a go of the venture. The first was to secure a variety that would give excellent yields in competition with the heavy cotton crop on the good soil in Mississippi County, Ark. The second was to develop a variety that would produce an oil yield comparable to soybeans in other areas.

Most of the soybeans being produced in that section of Arkansas when the venture was started averaged from 12 to 15 percent oil. The Macoupin, satisfactory for late planting, was the first introduced and averaged from 18 to 19 percent oil. After that G. H. Banks, manager of the plant until his transfer in recent months to take charge of the firm's new processing plant in Kansas City, Mo., developed the Ralsoy strain which, in addition to outyielding the parent stock some 4 to 6 bushels to the acre, showed an oil content around 19 percent as compared to 16 to 17 percent for the Arksoy.

However, after four or five years of crushing soybeans at Osceola failure to show profits resulted in a careful analysis of the whole operation. It was discovered that it required from eight to 10 times as much manpower to produce a ton of soybean oil meal at the firm's Osceola hydraulic plant as compared with its expeller plant at St. Louis. At a time when southern labor could be hired at 20 cents an hour this was not so serious a problem as now when labor costs 45 to 55 cents an hour.

As a result of this analysis the firm abandoned efforts to crush soybeans at Osceola but concluded the research work for its general benefit to the growers of the area.

The problems faced by Ralston Purina at Osceola are typical of the problems that will be met in industrial ventures in the South; and they particularly indicate the handicaps under which cottonseed mills labor in processing soybeans.

—s b d—

★ BOOKS ★

FATS AND OILS, AN OUTLINE OF THEIR CHEMISTRY AND TECHNOLOGY, by H. G. Kirchenbauer, research chemist, Colgate-Palmolive-Peet Co. 154 pages. Price $2.75. Reinhold Publishing Corporation, New York City.

Fats and oils derived from both plants and animals are becoming more and more diversified and specialized in their uses. In recent years many new and superior types have entered the market, and have won a permanent place for themselves.

This well illustrated little volume presents a brief, simple survey of the origin, methods of extraction, chemistry, and processing of these important materials. It is especially designed for the use of students in the many branches of industrial chemistry into which these products enter.

Only a short section is devoted to soybeans.

The author, an experienced research chemist, has for years been active in the American soap industry.

—s b d—

SOYS IN HAWAII

A large stock of soybean seed acquired in Hawaii during the early part of the war to be planted as an emergency crop should the islands be blockaded by Japan has now been placed on the market for direct consumption, reports Colin G. Lennox, president of the Board of Agriculture and Forestry of the Territory of Hawaii.

Mr. Lennox says that soybeans were considered a valuable emergency crop, and that the stock of seed was accumulated by the local Office of Civilian Defense. Since the Territory was able to obtain normal supplies of foodstuffs at all times and was never forced to a subsistence ration, the seed was never planted. It has now lost its viability, and it is considered that that phase of the emergency is over.

SOYBEANS A LA "PLOWMAN'S FOLLY"

A nine and one-half acre crop of soybeans was grown on disked cornstalk land by Roland Hutchinson, hybrid corn dealer at Acton, Ind., in 1944.

Hutchinson has applied to soybeans and other crops the *Plowman's Folly* theory of farming, which holds that organic matter for best results should be incorporated into the surface of the soil rather than plowed down to a depth of six or more inches.

The *Digest* requested of Mr. Hutchinson information concerning his methods and results, and received the following answer:

Dear Sir:

In reply to your letter of the 8th concerning the planting of Lincoln beans on disked cornstalk land, a lot of particulars have to be taken into consideration.

. This small field averaged 26½ bu. per acre of beans and I think I am safe in saying there was not much more than a small wagon load of stems and hulls on this 9½ acres. This field made as much as any field of beans in the vicinity with a few exceptions.

This field was in hybrid seed corn in 1943 and produced well. The corn was fertilized in the row, 150 lbs. 0-12-12 per acre.

Also it was laid out in plots long-ways and plowed in lands and fertilizer was plowed under at the rate of 200 lbs. of 7-9-9 on some plots and upwards to 800 lbs of 7-9-9 on other plots. This fertilizer was home mixed with 0-12-12 and Aero Cynamid. Also a 14-inch crop of green English clover was turned under. All this was done in 1943 for the hybrid seed corn. A good crop of stalks and ears was grown.

This field was sowed in Lincoln beans on June 7, 1944, at the rate of 30 lbs. of seed per acre in 42-inch rows because that is all the closer I could plant. I think a 28-inch row is better but is impossible for me to do at the present. The first disking was lengthways of the corn rows about May 1st and each week thereafter in opposite directions until planted. No stalks were visible in large pieces at time of sowing, although they were there all mixed with the top soil. The beans were rotary hoed twice and cultivated once.

We had a very bad drouth in our community in 1944 although we were blessed with an average crop of corn and beans.

I think enough of the disking idea that I am not going to discard it.

The main thing is we keep more organic matter on top of the ground or close to the top of the ground so that eorsion will be lessened. To my estimation there is more moisture for the plant to grow on.

I intend to follow *Plowman's Folly* idea more thoroughly this year as I have rye sowed in some of my stalk fields to disk under for beans.

In my own opinion the author of *Plowman's Folly* has some real sound judgment and until it is proven different to me I'll continue to believe it.

We also have some other experiments besides beans in which this idea was used.

Respectfully,

HUTCHINSON BROS.
Roland Hutchinson.

THE SOYBEAN---ITS NEW IMPORTANCE IN *Virginia*

By M. H. McVICKAR

Associate Agronomist, Virginia Agricultural Experiment Station, Blacksburg, Va.

SOYBEAN research is not a recent development in Virginia. In 1924, Dr. T. K. Wolfe, then agronomist at the Virginia Agricultural Experiment Station, published a bulletin based on research prior to that date. Although improved methods and newer varieties have antiquated many of Dr. Wolfe's findings, many things pointed out at that date are still recommended.

The present war has stimulated a keener interest in this crop in our state. Our farmers have found that soybeans produce a desirable type of hay for farm livestock; make good silage; afford desirable pasturage, both in the green and mature stages; the seed produces a high quality oil; and the meal left, after expressing the oil, is a palatable high protein concentrate of superior quality. The past few years have also seen an increased interest in the garden type soybeans. Credit for this increased human consumption of soybeans goes largely to the extension nutrition specialists who have impressed upon John Q. Public the merits of this easily raised vegetable.

Almost without exception, climatic and soil conditions in all sections of Virginia are favorable to the growth of this important crop, and profitable yields may be obtained if correct cultural practices are followed.

COOPERATION WITH U.S.D.A.

A great portion of the soybean research in Virginia is conducted in cooperation with the U.S.D.A., operating through the U. S. Regional Soybean Laboratory, located at Urbana, Ill. The Regional Laboratory furnishes seed for planting, specialized equipment, and some funds. After harvest and when notes are complete, samples are submitted for chemical analysis. Under Mr. Paul R. Henson's supervision, who is U.S.D.A. coordinator for the southern states, the data on various maturity groups are compiled and combined, giving added significance to the research in any one state.

The U. S. Regional Soybean Laboratory expanded its program to include our state along with 11 other southern states as a result of war time needs for vegetable oils. The main objective of the Regional Program is the development of superior varieties of soybeans for industrial purposes, for the South. An essential part of this objective is the evaluation of existing southern strains and varieties of soybeans in Uniform Variety Tests. As an aid in developing still better varieties, the Regional Laboratory furnishes our state, as well as other states desiring material, hybrid crosses for selection purposes. The U.S.D.A.-state cooperative program has already borne fruit, and the future looks still brighter.

MATURITY OF VARIETIES VARIES GREATLY

Due to the extreme differences in climatic conditions in Virginia, the growing season varies greatly. At Burke's Garden, the normal growing season is 148 days, while at Norfolk, the normal growing season is 237 days. Therefore, although geographically a southern state; climatically speaking, large portions of Virginia are adapted to Cornbelt varieties. Thus, Virginia's variety tests included not only southern strains but also mid-west strains.

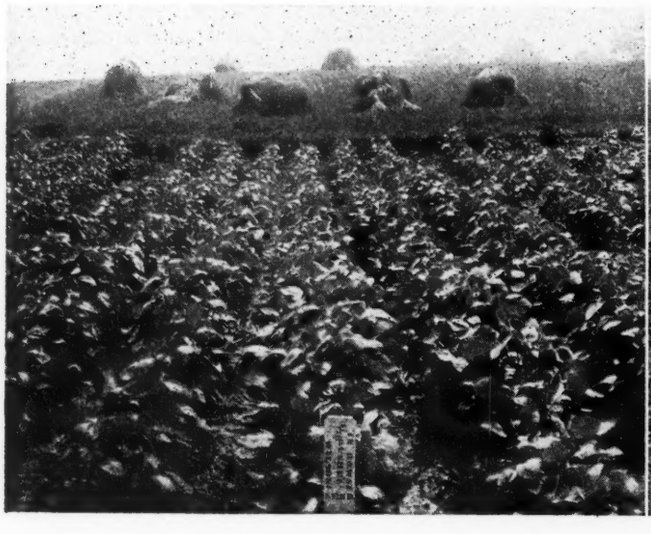
The recommendation as to date of planting in Virginia is: Plant as near corn-planting time as possible. Dr. T. B. Hutcheson, chief agronomist, Virginia Agricultural Experiment Station, has found that the maturity of soybeans is greatly affected by the length of day, and that many varieties vary in days required for maturity, depending on the date of planting. Generally speaking, early planted beans have a tendency to make more vegetative growth than the same varieties planted later, and they also make larger yields. Chemical data indicates also that early planted beans carry a higher oil content than the same variety planted later.

YIELDS ARE GOOD

In most instances, seed yields of oil varieties have been good. At Blacksburg, 30 to 40-bushel yields per acre were common in 1943; and even with the very dry growing season experienced in 1944, most varieties yielded better than 20 bushels per acre. Time required for maturity of the varieties grown at Blacksburg was about 115 days from planting to final maturity. The oil content of Cornbelt varieties grown at Blacksburg compared very

(Continued on page 22)

Left: Rates of seeding test, as it affects yield and quality of hay. Right: Soybean variety test on Virginia Agricultural Experiment Station, Blacksburg, Va.



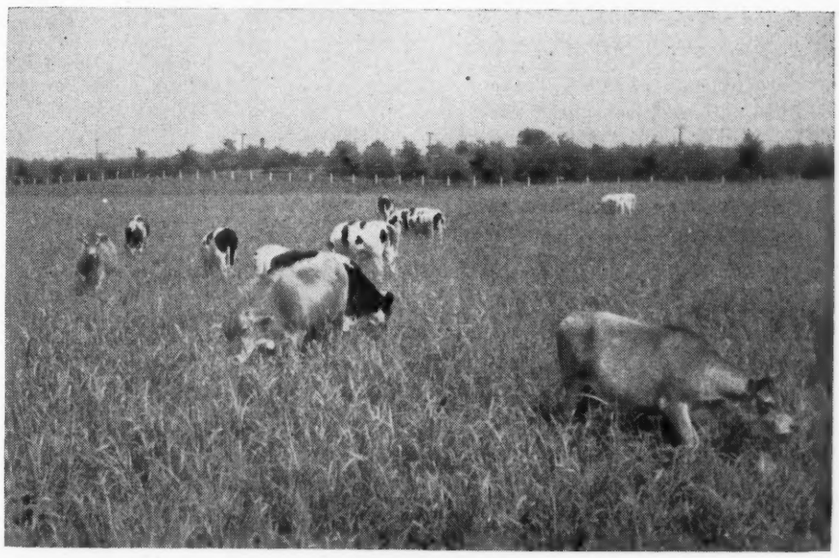
Soybeans Valuable in *Summer Pastures*

By W. B. NEVENS
Illinois Agricultural Experiment Station

SOYBEANS have proved to be a valuable part of annual pastures used to supply extra feed during July and August. Most grass pastures, such as bluegrass, redtop, and timothy, take a rest when hot summer weather arrives and produce only small amounts of forage for a period of six to eight weeks. A simple way of furnishing extra feed during the period when grass pastures are low in yield is to grow a few acres of soybeans and Sudan grass mixture. This crop will furnish a large amount of feed at the time it is most needed, will help to maintain milk yields at a high level, and will provide the feed at a lower cost than barn feeding.

The crop is planted on a well-prepared seed bed soon after corn planting time, or about the usual season for planting beans. If soybeans have not recently been grown on the field, the seed should be inoculated before planting. The beans and Sudan grass seed are mixed on a clean floor in the proportions of 1.5 bushels of beans and 25 pounds of Sudan grass. This is the seeding rate per acre. On very fertile soils, 30 pounds of Sudan may be used. The mixed seed is planted with a grain drill.

Fertilization with barnyard manure or with other suitable fertilizers before preparing the seed bed helps to insure rapid growth and an early pasturing date. Fertilization also greatly boosts the yield. It does not pay to invest money in seed and labor at present prices to seed a field which will not produce a good crop of corn or beans. One cannot expect to get a good pasture on that kind of land. Pasture is a crop and should be treated as such. On good land pasture provides a large amount of feed at low cost, and that is true of this mixture of soybeans-Sudan when given a fair chance. Yields on poverty-stricken land are likely to be disappointing.



Soybeans and Sudan grass supplies much feed in July and August. This pasture mixture keeps on growing despite dry weather and provides green feed when most grass pastures are bare and brown.

Soybeans resisted chinch bugs in this pasture. A late-planted field of soybeans-Sudan at the Illinois Station in 1944 was so badly infested with chinch bugs that most of the Sudan was killed. The soybeans survived and made a lot of feed.

Under central Illinois conditions, soybeans-Sudan planted the third or fourth week of May are usually ready for pasture about July 10. At that time the Sudan is 18 to 24 inches high. The crop should not be pastured earlier because of the danger of prussic acid poisoning. Most of the pasture value is obtained between July 10 and August 31, the period when extra pasture is most needed.

Close pasturing of this crop may prove disastrous. When Sudan grass is eaten close to the ground, it recovers slowly, and needs an abundance of moisture to make a vigorous new growth. Soybeans aid in pasture management because the soybeans are not as palatable as the Sudan. The Sudan, of course, grows taller than the beans. Cattle will eat the Sudan down to the tops of the beans and stop there unless they are very short of feed. This is the time to take the cattle out and let the pasture rest for two or three weeks until a vigorous new growth appears. Another plan by which close grazing can be prevented and the crop given a recovery period is to divide the pasture into several parts and to pasture these in rotation. The beans also make renewed growth after grazing during July, but make little additional growth after August 15. They add considerably to the yield and nutritive value of the pasture but are usually grazed out by September 1.

Another valuable feature of soybeans in this pasture mixture is their insurance against chinch bug damage. Chinch bugs attacked and killed out nearly all the Sudan in one field of soybeans-Sudan which was planted about June 10, 1944, but a splendid stand of beans remained and furnished a lot of pasture. Another field a short distance away which was planted about May 20 to soybeans-Sudan showed only slight injury.

Trials at the Illinois station have shown that the soybeans-Sudan combination has yielded about twice as much feed as a well-fertilized bluegrass pasture. When a winter cereal grain like winter rye is used for early spring pasture and then is followed by a crop of soybeans-Sudan on the same field, the total feed produced is three times that of good bluegrass. Because of the cost of seed and the labor and machinery expense in the annual sowing of the soybeans-Sudan crop, it is recommended that grass pastures should not be replaced but that a few acres of the soybeans-Sudan be grown to supplement the present pastures. For a herd of 20 cows, five to eight acres of soybeans-Sudan pasture will provide large amounts of extra feed at the time it is most needed.

SOYBEANS AND COTTONSEED --- STRONG COMPETITORS

• *Acting on the assumption that no industry in this modern world can exist in a vacuum and that we should know our competitors, the* SOYBEAN DIGEST *hopes to publish in coming months articles on competing oilseeds, both foreign and domestic. These are to be written where possible by representatives of the industries concerned. At the request of the editors, Mr. A. L. Ward, educational director of the National Cottonseed Products Association, kindly wrote this article on cottonseed.*

Cotton-seed

By A. L. WARD

Educational Director
National Cottonseed Products Ass'n

STRONG competitors — yet great allies. That is the most accurate, brief description we can find for the relationship between the cottonseed and soybean industries.

Cottonseed, in fact, blazed the trail in developing markets for protein meal and vegetable oil in the United States and made it easier for soybean oil and meal to find acceptance. The pioneer work done with cottonseed — the mistakes made and the lessons learned — have been of great value in the development of the soybean industry in more recent years.

Furthermore, the soybean and cottonseed industries have far more problems and goals in common than they do differences. Both industries need and will benefit from better understanding and cooperation; and recognition of this need for understanding and cooperation caused *The Soybean Digest* to offer, and the writer to accept, this opportunity to contribute an article about the cottonseed crushing industry and its products.

Two examples suggest the trail-blazing done by the cottonseed oil industry, to the benefit of all vegetable oils and proteins.

The annual availability of cottonseed oil was largely responsible for the development of the American vegetable oil industry. At first, there was no market for cottonseed products, or for cottonseed. Then, oil began to find foreign markets as a substitute for olive oil. About 1870 to 1880, it began to be used in both margarine and shortening. The development of hydrogenation gave rise to the American vegetable shortening industry. The great markets for shortening, margarine, salad oil and salad dressing that we have in this country today spring, for the most part, from pioneer research, processing developments, and merchandising done with cottonseed oil and its products.

Markets for protein oil meal and cake also had to be developed through a slow, and often painful, process. Although the Chinese ground cottonseed for cattle feed centuries ago, and a gold medal was offered for cake made from cottonseed in the West Indies as early as 1783, the cottonseed crushing industry in this country had to "start from scratch" in finding markets for its oil meal and cake. While feeding developed around some cotton oil mills as early as 1870 to 1880, and the fertilizer value of the oil meal was recognized, it was Europe that first became an extensive user of cottonseed feed products. In the 25 years from 1900 to 1924, the South exported some 11,305,000 tons of cottonseed cake and meal—as much as 875,000 tons in a single year, or 60 percent of the production. A large proportion of the oil meal remaining in this country was used for fertilizer.

EDUCATIONAL SERVICE

During the latter years of large export trade, some farseeing leaders of the cotton oil industry became concerned about the future of this trade. They saw the need for efforts to develop domestic markets for cottonseed feed products; and in 1926 the Texas Cottonseed Crushers' Association established the Educational Service, later taken over and maintained since by the National Cottonseed Products Association.

Throughout 19 years of educational and advertising activities this Educational Serv

GREAT ALLIES

On opposite page, a mechanical picker in a field of cotton. This is one of the machines of many types that are revolutionizing cotton production and helping the cotton and cottonseed crushing industries to strengthen their position for the postwar period. Left, taking an official sample of cottonseed oil, in accordance with the trading rules of the National Cottonseed Products Association. In use by the cottonseed crushing industry for about 50 years, these rules have set the pattern for similar trade practices in related industries.

ice has emphasized the importance of protein concentrates in balanced rations. While, naturally, pointing out the merits of cottonseed oil meal and cake, it has also consistently stated that the choice of feedstuffs depends largely upon cost and availability.

ECONOMIC STATUS TODAY

With this background in mind, we are in a better position to analyze the economic importance of cottonseed and the cottonseed crushing industry, today; and to evaluate its relationship to the soybean industry.

Cotton, as everyone knows, is the major crop of the South and Southwest; but not everyone knows that cottonseed usually ranks second or third in crop value annually in most of the cotton-growing states. For example, in Mississippi, the second largest cotton producer, cash receipts from cottonseed in 1944 amounted to $34,846,000 — or about one-eighth of the total cash receipts from all crops. Together, cotton and cottonseed brought Mississippi last year $250,799,000 — or about 89 percent of all cash receipts from crops. It should be emphasized that this 89 percent of cash receipts came from cotton acreage which amounted to only 35 percent of total Mississippi crop acreage — indicating the high value per acre of cotton and seed as compared with other crops.

To overcome a common misconception that the Cottonbelt is a "one-crop" area, it should be pointed out that 10 leading cotton states plant only about one-fourth of their crop land to this crop. Leading Cornbelt states plant a larger proportion of their acreage in corn. And in 1944 Illinois planted almost as great a percentage of its crop land to soybeans as the proportion of Texas crop land in cotton.

Cash receipts in all cotton states in 1944 from cotton were $1,301,839,000; and from cottonseed, $188,325,000, reports the U. S. Department of Agriculture, or a total of $1,490,164,000. For comparison, cash receipts from all food grains in the United States were $1,191,361,000; from feed grains and hay, $1,115,508,000; from soybeans, flaxseed and peanuts, combined, $477,433,000. (These figures are from February, 1945, "Farm Income Situation," U. S. Department of Agriculture. Statistics based on "crop values" or season, rather than calendar year, will vary somewhat, but not change materially the relationship, in most cases.)

Farm income tells only a part of the economic importance of cotton and cottonseed. In addition to the 10 million people living on some 2 million cotton-growing farms (approximately one-third of the farm population of the nation), approximately 3,500,000 other persons depend directly upon cotton for a living. In other words, some 10 percent of our total population is directly dependent upon cotton.

There are approximately 12,000 cotton gins in the United States today, 1,600 cotton textile mills, and thousands of cotton warehouses, compresses, firms and other businesses directly related to cotton production. The whole economy of the South and Southwest is geared to cotton, and its maintenance is of the greatest importance to the economy of the nation as a whole. As the Agricultural Adjustment Administration has pointed out, "The cotton farm is the source of raw materials for a very long series of commercial processing operations unequaled in the case of any other important field crop."

400 COTTON OIL MILLS

Cotton oil mills, alone, number 400, scattered from North Carolina to California; and from Illinois to Florida. There is far less concentration of cotton oil mills than is the case with other oilseed crushers. Most of the cotton oil mills are in relatively small towns, and they are often the leading industry of that town. For this reason, their economic importance to the community is greater than the dollars-and-cents totals of expenditures for wages, materials, etc., indicate. In addition, the latest census figures, for 1939, are outdated and far below wartime costs and values; but even the 1939 census showed that cotton oil mills employed more than 18,500 persons, and spent in that year about $151,500,000 for materials, supplies, wages and other costs.

COTTONSEED AND PRODUCTS

In addition to the oil and protein that are common to all of the oilseeds, cottonseed supplies two other important products — cotton linters and cottonseed hulls. (These four, of course, are in addition to the cotton fiber or "lint cotton," which is still the most valuable single product of the cotton plant. While it varies in different states, from season to season, and even from day to day, the average ratio of products obtained from the cotton plant is approximately: Each 500 pounds of lint cotton, or fiber, is accompanied by 900 pounds of cottonseed which yield an average of 140 pounds of cottonseed oil; 400 pounds of cottonseed meal or cake; 240 pounds of cottonseed hulls; and 80 pounds of cotton linters.)

The prewar relative production and value of cottonseed products is indicated by the following average figures for the 10-year period, 1930-39:

COTTONSEED OIL — 1,421,691,000 lbs. produced annually for average annual value of $84,699,000.

COTTONSEED CAKE AND MEAL — 2,067,000 tons produced annually for an average annual value of $48,327,000.

COTTONSEED HULLS — 1,212,000 tons produced annually for an average annual value of $7,997,000.

COTTONSEED LINTERS — 1,197,174 bales (500 lbs. each) produced annually, average annual value, $16,051,000.

During this 10-year period, cotton oil mills crushed an average of 4,564,000 tons of cottonseed yearly, or about 77 percent of the estimated production of cottonseed (which includes planting seed, seed lost, etc.) The average number of mills crushing seed annually during the period was 478 and the average crush per mill was 9,552 tons.

These 10-year figures for the period 1930-39 include the worst depression years; and statistics more comparable to the present status of both the cottonseed and soybean crushing industries are those for the 5-year period, 1939-43. Average value of cottonseed oil in this period was $114,242,000; of cake and meal, $58,869,000; of linters, $25,938,000; and hulls, $8,398,000, annually; or a total of $207,447,000 for all cottonseed products.

Under recent policies of cotton acreage control, the already-large crushing capacity of cotton oil mills has far exceeded the supply of raw material available; the number of cotton oil mills operating has decreased; and some of the available crushing capacity has been used by Commodity Credit Corporation to crush soybeans from the Midwest, as well as peanuts and soybeans produced in the Cottonbelt. (Most of the relatively small annual crush of peanuts is done by mills that also crush cottonseed.)

No member of the soybean industry has to be reminded of the wartime importance and shortage of protein oil meal and vegetable oil; but it may be of interest that

since Pearl Harbor cotton oil mills have produced approximately 7 million tons of cottonseed cake and meal and 5 billion pounds of cottonseed oil.

Cotton linters deserve special mention for their wartime value. "Cottonseed linters," says A. Cecil Wamble of the Cotton Research Committee of Texas, "are the richest known commercial source of chemical cellulose which is converted with greater ease into more useful articles of higher quality than any other cellulose yielding material." In peacetime, these linters (short fibers left on the seed at the cotton gin but removed at the oil mill) are used in plastics, rayon and a wide variety of products.

In wartime, linters are one of the United States' most essential and valuable raw materials. In 1940, the Army listed them as "strategic material" of war; and in 1941, the government took control of all linters production and use. Largest of war uses is for smokeless powder for every gun from the infantryman's rifle to battleship's largest gun; and despite much research for substitutes, linters remain the preferred source of cellulose for munitions. One bale of cotton linters provides smokeless powder to fire 100,000 rounds of rifle ammunition. SINCE PEARL HARBOR, COTTON OIL MILLS HAVE PRODUCED ENOUGH LINTERS TO FIRE OVER 460 BILLION ROUNDS OF RIFLE AMMUNITION: BUT LINTERS ARE STILL A CRITICAL WAR MATERIAL. They are used also in making plastics for warplane windows and noses, high-tenacity rayon, and other war products.

Cottonseed hulls, normally used chiefly as a livestock roughage feed that is comparable in feeding value to average grass hay, also have proved a valuable war material, as a source of furfural used in the production of synthetic rubber and other needed war products.

PROTEIN FOR HUMAN FOODS

Development of the potentially important field of cottonseed as a source of protein for human food has been done chiefly by the Traders Oil Mill Co. of Fort Worth, Texas, which produces a variety of high-quality protein foods. The pioneer work which this firm has been carrying on for many years gained added significance in wartime, as is indicated by the following statement by D. Breese Jones, Bureau of Human Nutrition and Home Economics, Washington:

"There is now available a partially defatted, wholesome and palatable cottonseed flour especially prepared for human use. Large quantities of this flour have been shipped overseas for lend lease use. Its high protein content of 50 percent is exceeded by only a few other foods. The digestibility of cottonseed globulin, which represents the greater part of the seed protein, is nearly equal to casein of milk. The total protein of cottonseed flour is as digestible as peas and beans, 80 percent as digestible as meat, and 90 percent as cereals.

"The protein of cottonseed flour is a good source of the nutritionally essential amino acids. It has a growth-promoting value approximately four and a half times that of wheat flour. It is well suited to supplement the proteins of certain other foods, particularly those of the cereal grains. Wheat flour is known to be deficient in some of the essential amino acids abundant in cottonseed flour. Addition of as little as 5 parts of cottonseed flour to 95 parts of wheat flour produces a mixture containing 16 percent more protein than wheat flour alone, and a protein combination definitely superior in its growth-promoting value to the same quantity of protein from wheat flour.

"Use of cottonseed flour offers an effective, economical and practical way of helping to meet a shortage of protein food for relief in foreign lands. Furthermore, because of its value as a protein supplement, a more extended domestic use of cottonseed flour would raise the nutritional level of the diet of people living in areas where cereals, particularly corn, constitute a major source of protein in the diet."

THE FUTURE OF COTTON

It would be impossible to consider the postwar outlook for cottonseed products without discussing the general cotton situation. Obviously, this is too broad a subject to cover here. To those who, however, have been impressed by the many dire predictions of the passing of cotton, here is a timely warning: "Don't sell cotton short." People have been burying the cotton industry for a long time; yet cotton has not only survived but increased in usefulness and economic value.

In fact, cotton production today is on a sounder basis than ever before in history and will be on a strengthened basis in the future. Here are some of the reasons:

Cotton will continue to be the most important crop of the Cottonbelt from the standpoint of value per acre and total gross income; because, as Doctor A. B. Cox, University of Texas Bureau of Business Research, points out:

"Cotton has the distinct advantage of being two crops in one—a fiber crop and a seed crop. Cotton's production capacity in terms of value per acre is the highest of any of the five major crops of the nation which together occupy 80 percent of all cultivated land. During the 10 years, 1932-41, cotton and cottonseed produced an average farm value per acre of $27.97; corn, $14.79; wheat, $10.32; oats, $8.65; and all hay an average of about $10.77."

At the same time, the Cottonbelt has diversified as indicated by: Figures already quoted that less than one-fourth of the crop land is now in cotton; by the marked increase in livestock numbers and quality in recent years; by pasture improvement progress; more general and thorough development of soil conservation measures than in other areas; and other well established trends.

This development and diversified income will put cotton farmers in a better position to withstand possible market reverses without too greatly affecting their buying power and the economy of the Cottonbelt. It also means more dependable income and a larger market, within the Cottonbelt, for cotton goods and other products.

The growing livestock industry means the manufacturing of the South's raw materials, including cottonseed meal, cake and hulls, into more finished products. This in turn means more total income and more diversified income. These trends also will enable the Cottonbelt to utilize its labor more completely and more profitably.

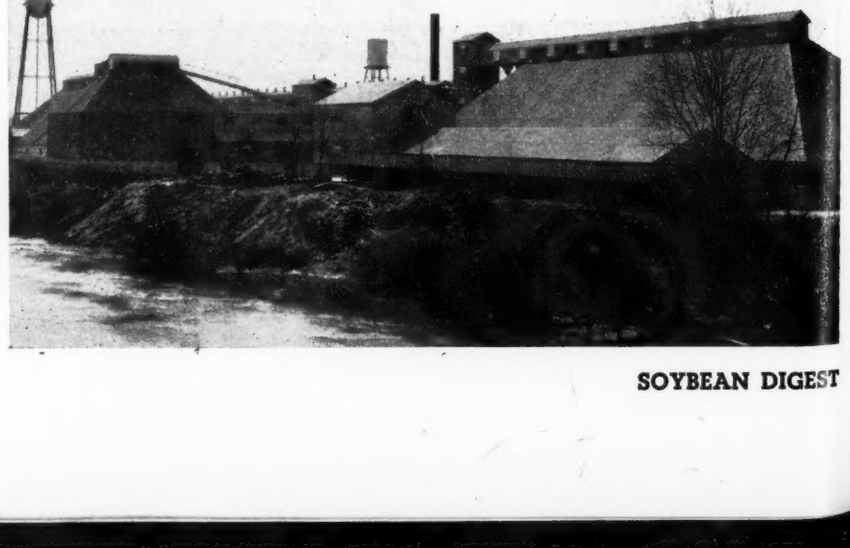
A mechanical revolution, comparable to the influence of the invention of the cotton gin 150 years ago, is taking place in cotton. In addition to mechanical harvesters, which have proved that they are here to stay and will cut the cost of producing cotton as much as 50 percent in some areas, other machinery is being used and will be used to an increasing extent. The Stoneville Experiment Station, in the heart of the great Delta cotton area of Mississippi, comments:

"We have successfully produced cotton, using the flame cultivator and International picker, WITHOUT AN HOUR OF HAND LABOR."

To anyone who knows anything about cotton and the hand labor that has been necessary in its past production, the possibilities that this reveals for increasing markets and lowering production costs seem virtually unlimited.

Cotton, it is quite true, will face many

Cotton oil mills representative of approximately 400 such oil mills in cotton growing states, from North Carolina to California.



difficulties in the postwar period. Its future will be influenced by governmental policies, international trade, labor conditions and many other factors that are uncertain. But, so will the future of soybeans—of corn producers—of hog raisers—and of doctors, lawyers and plane manufacturers.

Cotton supplies cellulose, protein and vegetable oil, three of mankind's and industry's most needed raw materials. In terms of human need, there has never been an oversupply of any of these. The Cottonbelt, containing over half of the world's best cotton land, has proved its ability to produce these needed materials. Is it too much to expect ways to be found to bridge the gap between proven ability to produce, and proven need for the products?

PROTEIN OUTLOOK

What about the future of the two cottonseed products that directly concern the soybean industry—cottonseed meal, or cake, and cottonseed oil?

Cottonseed flour may find increasing markets for human food, but it seems probable that the bulk of the protein of cottonseed will continue to move as livestock feed for a long time. It seems equally likely that the chief market for this feed in the future will be in areas where it has been the dominant protein concentrate for many years in the past. In these areas, it has played a very important part in the development of the livestock industry; it has certain advantages that give it consumer preference; it has consumer confidence built up through many years of use and concentrated advertising, educational and merchandising effort. Availability, experience and other factors will serve to give it a strong competitive advantage in most of this "home territory."

Cotton-growing areas are, of course, the primary "home market" for cottonseed products. This region includes North Carolina, South Carolina, Georgia, Alabama, Florida, Tennessee, Mississippi, Louisiana, Arkansas, Oklahoma, Texas, New Mexico, Arizona and California, with part of southern Missouri, Virginia and Illinois. It is logical to expect cotton growers to prefer their "home-grown" feed in this region, just as it is to expect soybean growers to use soybean oil meal.

A second area which has always been a large user of cottonseed products includes all or a part of the states of Kansas, Nebraska, Colorado, Wyoming, Montana, Utah, Nevada, Idaho, Washington and Oregon; and in the East, Kentucky and West Virginia. States immediately adjacent to the Cottonbelt and Soybean Belt doubtless will be a highly competitive area. This competition will be a good thing for both industries, and for individual firms within each industry; it will help to develop better processing methods, aggressive merchandising efforts and research programs that are necessary to progress.

There will also be feeders and feed manufacturers outside of these two regions who want cottonseed products, just as there will be those in the Cottonbelt who prefer soybean products; and these will also help to maintain a healthy, competitive spirit between the two industries.

There is a very large territory with a great livestock and poultry population, outside of the Cottonbelt and the competitive area just mentioned. The protein requirements for balanced livestock and poultry rations in this territory, particularly the Northeast Seaboard States and soybean-producing states, should—with concentrated educational work—exceed the present production of soybean oil meal and other protein concentrates.

Here, the writer believes, is the greatest opportunity for the soybean industry. By "selling" the sound idea of using adequate protein in balanced rations in this region, which in the past has been a protein-deficient area, the soybean industry can develop a market for all it can produce. Such a market would be the cheapest and easiest to develop, and the most dependable market.

VEGETABLE OIL OUTLOOK

The outlook in the vegetable oil field does not differ greatly from that in the protein field. The problems that the soybean and cottonseed crushing industries have in common in marketing their oils are far more numerous than their differences.

Cottonseed oil has strong advantages in some fields of use, such as for certain food products.

Soybean oil has other strong advantages in other fields of use, particularly industrial uses.

Competition between the two oils will stimulate chemical research, technological progress, sales and advertising aggressiveness in both industries, to their benefit.

In the long run, however, the consumption of soybean oil and cottonseed oil will depend more upon the solution of such common problems as the removal of trade barriers which restrict the sale of margarine, regardless of whether it contains cottonseed oil or soybean oil; the development of consumer demand and buying power for adequate amounts of fats in the diet of Americans, who have always subsisted on a fat-deficient diet; and other broad problems of maintaining and increasing the use of vegetable oil products, as a whole.

Let it be emphasized and re-emphasized that the greatest opportunity for the cottonseed crushing industry—and we believe for every oilseed industry—lies in the field of broad, constructive and forward-looking merchandising of its own products, on their own merits; plus cooperation with other industries—your soybean industry—in the broad field of developing greater use of protein and oil.

Burlison Honored at Illinois

Dr. William L. Burlison, right, receives a parchment from staff members in the agronomy department at the University of Illinois on April 2, citing his leadership as department head for 25 years. Dean H. P. Rusk of the College of Agriculture is making the presentation. Shown on the table is a huge angel food cake with 25 candles and a gold wrist watch which were also presented to Dr. Burlison. The parchment was inscribed "Greetings, Doctor Burlison, and good wishes on the 25th anniversary of your leadership as head of agronomy. As you pass this significant milestone we salute you and express our appreciation of your labor with and for us through the years. U. of I. Agronomy and U.S.D.A. Associates." In the 33 years of his affiliation with the Illinois College of Agriculture, Doctor Burlison has contributed in large measure to advances in improved crop production throughout Illinois and particularly to research with corn hybrids and soybeans.

SAYS BULLIS:

TRADE MORE WITH EUROPE

Why is two-thirds of the world short on food while the balance often has such surpluses that the economies of various nations are dislocated?

Harry A. Bullis, president of General Mills, Inc., seeks a solution of this dilemma in an article, "We Can All Have Better Food and More of It," in April 14 *Liberty*.

The answer, in Bullis' opinion, lies on the one hand in freer trade between underfed Europe with surplus producing regions such as the U. S., Canada and Argentina to enable us to swap surpluses for European goods; and on the other hand in direct assistance to the peoples of the Far East which would enable them to expand their productive capacity and feed themselves.

In an analysis of economic ills during the last 15 years, Bullis points out that each country in Europe tried to make itself economically self-sufficient, especially in the matter of foodstuffs and war supplies. "In the latter 1930's consumers of wheat in Italy and France, and of wheat, pork, and lard in Germany, paid annually one and a half billion dollars more for these commodities than they would have paid if they had purchased them in efficient surplus-producing countries. At the same time benefit payments to farmers in this country who restricted their production reached an annual total of more than half a billion dollars.

"It was such absurd policies as this—squandering billions of dollars to force the production at home of foodstuffs which might have been purchased much more cheaply abroad — that prevented most Europeans from having better food in the period between wars.

"Cooperation between the United States and western Europe with regard to production and distribution of foodstuffs would be to the advantage of both.

"If Europe would do this, the efficient grain-producing countries — the United States, Canada, Australia, and Argentina — would have a market for all their surplus grain at favorable prices.

"Certain concessions would be required on our part. It would be necessary that America, including our agricultural population, be willing to accept from Europe enough goods (mostly manufactures) to permit Europe to pay for its purchases."

Bullis sees the problems of the Orient as being quite different. "Increase in agricultural and industrial productivity of these Oriental countries is the only sound way out . . ."

"If the world is to be better fed, it is essential that the general level of food production be raised rather than lowered. The lowering of trade barriers would be more effective than the lowering of production in preventing burdensome surpluses."

SOYBEAN YIELD CONTESTS ARE ANNOUNCED

The 1945 soybean yield contests have been announced by the Indiana Corn Growers' Association and the Illinois Crop Improvement Association for the respective states.

Membership in the associations is one requirement for entrance in the contest. Closing date for entrance in the Indiana contest is May 15, for Illinois June 1.

For the Indiana contest, "rules will be the same as those that have been followed up to date which require that two or more acres out of a field of at least 10 acres shall be combined, the beans weighed, sample taken for moisture determination immediately and the records witnessed by the county agent or his delegated representative," says K. E. Beeson, secretary-treasurer.

In Illinois the contest will be on 10 acres, as in the past. Awards will be on a regional basis again this year. Contoured fields are acceptable.

Those interested in entering the Illinois and Indiana contests should write:

ILLINOIS

Illinois Crop Improvement Association, Urbana-Lincoln Hotel, Urbana, Illinois.

INDIANA

K. E. Beeson, Secretary-Treasurer, Indiana Corn Growers' Association, Purdue University, Lafayette, Indiana.

Due to the war and the labor situation the Iowa 5-acre soybean yield contest will be suspended in 1945, the board of directors and the executive committee of the Iowa Corn and Small Grain Growers' Association have decided.

The announcement is made by Joe L. Robinson, Ames, the secretary. The fourth annual Iowa contest was held in 1944.

The Nebraska Grain Improvement Association also has decided to dispense with the Nebraska soybean yield contest this year.

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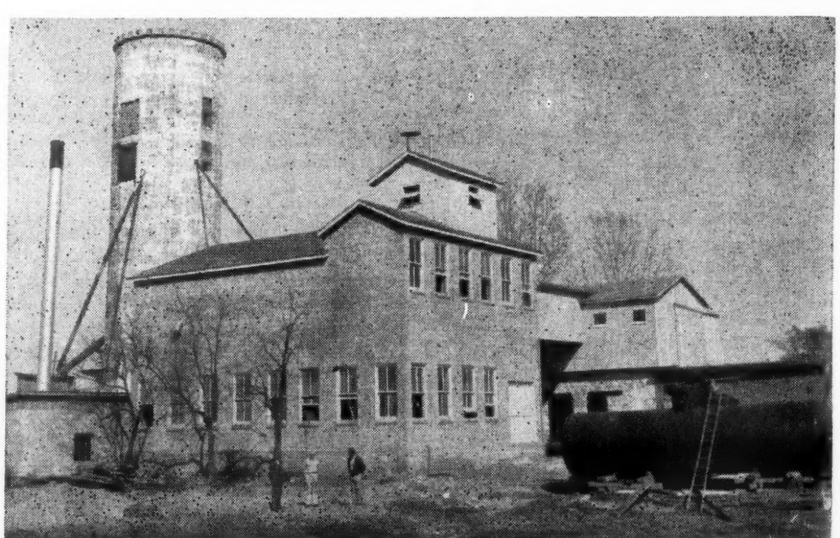
OHIO RULING ON SOYA BUTTER

Federal Judge Robert N. Wilkin of Cleveland, Ohio, has ruled that the soya butter produced by Butler Food Products of Cedar Lakes, Mich., is not taxable as margarine nor should it carry the margarine label.

A suit brought by William G. Barnard, head of the Natural Food Institute of Cleveland, and Howard Butler of Butler Food Products, charged that soya butter was forced off the Ohio market because of conflicting federal rulings.

The Bureau of Internal Revenue has ruled that soya butter is margarine, subject to federal tax and license fees. But the Food and Drug Administration holds that the product is not margarine and to so label it would be misbranding.



Illinois Agricultural Association

Illinois Cooperative Soybean Mill

The first cooperative soybean processing unit in Illinois, the Allhambra Grain & Feed Co., Madison County, Ill., began full production March 1.

The mill is housed in a building 36 feet by 48 feet with a height of 22 feet. The building is of concrete and concrete block construction. All processing equipment is housed in this building.

Storage space for soybean meal is provided in a two-story building 24 feet by 60 feet. Part of the structure is over the manager's office.

The soybean plant is located close to the parent elevator and beans are carried by gravity from the elevator to the mill.

A good demand for soybean meal exists in the dairy section around Alhambra, but some of the meal will be shipped out. Oil is stored in outside rail tank cars.

Directors of the cooperative are: William Dietz, A. J. Wetzel, W. J. Danderman, C. Wisnasky, C. Uhe, E. A. Klaus and E. H. Isenberg.

I. C. BRADLEY--
PIONEER PROCESSOR

I. C. BRADLEY

SOYBEAN processing is now so well assured as an industry it may not be recalled that its whole development has come in the past quarter-century. I. C. (Clark) Bradley has been a substantial part of that quarter-century of processing history. Now Clark is manager of the Allied Mills, Inc., Taylorville, Ill., plant. At the close of the first world war he was processing linseed, corn germ and mustard seed with a small outfit at Chicago Heights, Ill. Some agriculturists who were also soybean enthusiasts approached his firm to suggest that it try processing soybeans. Soybeans were then an Illinois hay crop but these men believed the miracle bean would have a much more substantial future if processors would lend a hand.

Those early soybeaners must have been persuasive, for the Chicago Heights Oil Manufacturing Co. agreed to some experimental processing and an attempt at developing a market for soy products.

The firm had both Anderson expeller and hydraulic equipment. They put Bradley in charge of the soybean promotion.

There was no reason why he should look on the venture with enthusiasm. Only sporadic attempts had been made in this country to process the crop. Livestock feeders knew nothing of soybean oil meal, feed mixers but little more. Both were apt to look with suspicion on anybody who suggested its use. Such soybean oil as was in use was imported. Buyers were satisfied with the foreign oil and saw no reason to change.

Clark prepared for an experimental processing in the fall of 1919, only to see practically all the soybeans harvested that year sold for seed. He was able to secure a few sorry looking beans that nobody else wanted. From these he obtained a few drums of oil as sorry looking as the beans. But he had learned something about the drying, the grinding and the use of the Anderson equipment, and that whetted his interest.

Growers assured him there would be plenty of soybeans for milling operations the fall following. But the demand remained good and the entire 1920 crop again went for seed. So Bradley bought 10 carloads of North Carolina and Virginia beans, of the Mammoth Yellow variety. With these and what soybeans he could pick up locally, he was able to begin operations.

Soon he was disposing of the first tank car of native soybean oil ever sold in Chicago. During 1921, 1922 and 1923 enough soybeans became available to permit processing in a small way on both the Anderson expellers and the hydraulic presses. Experience and a better quality of beans were producing a better oil. Evidence was accumulating that soybean processing could be made a successful operation. Several tank cars of soybean oil had been produced and marketed through Otto Eisenschiml's Scientific Oil Compounding Co. And several hundred tons of soybean oil meal also had been produced.

But the oil meal? Let Bradley tell about sales resistance back in 1921-22: "We begged, coaxed and forced feeders to try it. We hauled meal all over the state and gave feeders a bag or two to try. We sent meal to experiment stations, exhibited the meal at state and county fairs in Illinois and Indiana.

"We made soy flour, sent samples to bakeries, got a wheat flour mill to blend soy flour with wheat flour and distributed five-pound bags to hundreds of grocery stores where we could get permission to leave it."

In 1924 Funk Bros. Seed Co. of Bloomington, Ill., bought the Chicago Heights plant and Bradley went with it to Bloomington. It appeared that progress might be made by combining processing with the seed business. Here he was able to offer a market to all growers since he could buy soybeans both for seed and processing.

When he induced H. G. Atwood, president of the American Milling Co., at Peoria, to buy Funk's entire output of oil meal another big forward step had been taken in establishing a market.

But farmers still hesitated to plant the acreage that would place soybean processing on a firm basis. They feared that once the demand for seed had been met the price would go down.

Then the "Peoria plan" was evolved when Atwood, Funk and the Grange League Federation agreed that they would buy all the 1928 crop of soybeans produced from 50,000 acres at a guaranteed price of $1.35 a bushel.

The "Peoria plan" was an enormous factor in pushing Illinois to the front in soybean production. "Undoubtedly this advanced the progress of soybeans many years," Bradley believes.

Later Bradley was sent to Taylorville, Ill., to establish a processing plant for Funk. When American Milling Co. merged with Wayne Feed Co., to become Allied Mills, Inc., they purchased the Taylorville plant, retaining Bradley as its manager, a post he has held for the past 15 years.

Last year the Taylorville mill was destroyed by fire, but a new modern solvent extraction plant is rising in its place.

Bradley was one of the charter members of the National Soybean Processors Association. He served as its treasurer one year, and as secretary and president for two terms each.

J. L. DOIG

SOY IS A VALUABLE *Food Ingredient*

Not a Substitute

By JAMES L. DOIG

• *The author, Canadian representative of the A. E. Staley Mfg. Co., gives a good review of the use of soy in food products.*

IT IS rather difficult to understand why soy is so often referred to as a substitute to replace milk, fats, etc. Many years ago, when I first became interested in soy, when processing was crude and the resulting product high flavored; and erractic in quality, when little was known of its amazing food value and digestibility, except that it was a very economical source of protein, a little misconception of its functions in food processing was to be expected.

But today, when the general public is food value conscious, when proper nutrition is a live topic in gatherings, newspapers, and every day discussion, a product whose food value is endorsed by practically every known nutritional authority, is worthy of a much higher standing in the ranks of food ingredients.

Soy has played a major war role, both for and against us. It is common knowledge now that one of the great factors in the rapid German thrust through the Balkans in the early stages of the war, was due to the fact that their troops carried emergency rations (about 60% soy), practically eliminating commissary transportations.

The Nazi Party was estimated to have a billion bushels of soy in storage in Germany when the war began, and there is little doubt this played an important part in their ability to withstand the Allied blockade.

Our Russian allies, early recognizing this vital factor in moving large armies quickly, equipped their troops with similar rations, and when the final story of their phenomenal troop movements is told, it will be interesting to hear of the part soy played there.

Our own Canadian Navy lifeboats are equipped with life saving rations, containing large amounts of soy and a great deal of the nutritional value of foods in Britain was achieved by use of soy. All baked goods, sausage and meat pastes, were fortified with soy.

But it is in the postwar period when the movement of foodstuffs from Canada to feed the starving millions in the various war areas, will probably mean shortages here even greater than in the past four years and the part soy will play in postwar nutrition in Canada that we are vitally interested in.

It is believed by leading nutritionists that the intelligent use of properly processed soybean protein may solve the problem of providing well balanced diets in the low income groups.

Properly processed soy contains from 44 to 50 percent protein, and from 5 to 22 percent fats. It is recognized as one of the protective food items, as it contains most of the amino acids so necessary for normal bodily growth and development.

The protein of soy is classified as a digestible protein, and has the ability to increase the digestibility of other proteins when incorporated with them in food products. For instance the adding of soy proteins to baked wheat products increases the digestibility of the wheat proteins themselves.

The proper processing of soy requires not only elaborate costly machinery and skilled knowledge, but control of growing areas themselves, in order that only No. 1 grade beans may be processed for human food.

Soy products are now offered by reputable processors, are food ingredients of high nutritional value, palatable in flavor and color, which are being successfully incorporated in many staple foods, not as a substitute, but to raise the nutritional value and palate appeal of the foods themselves.

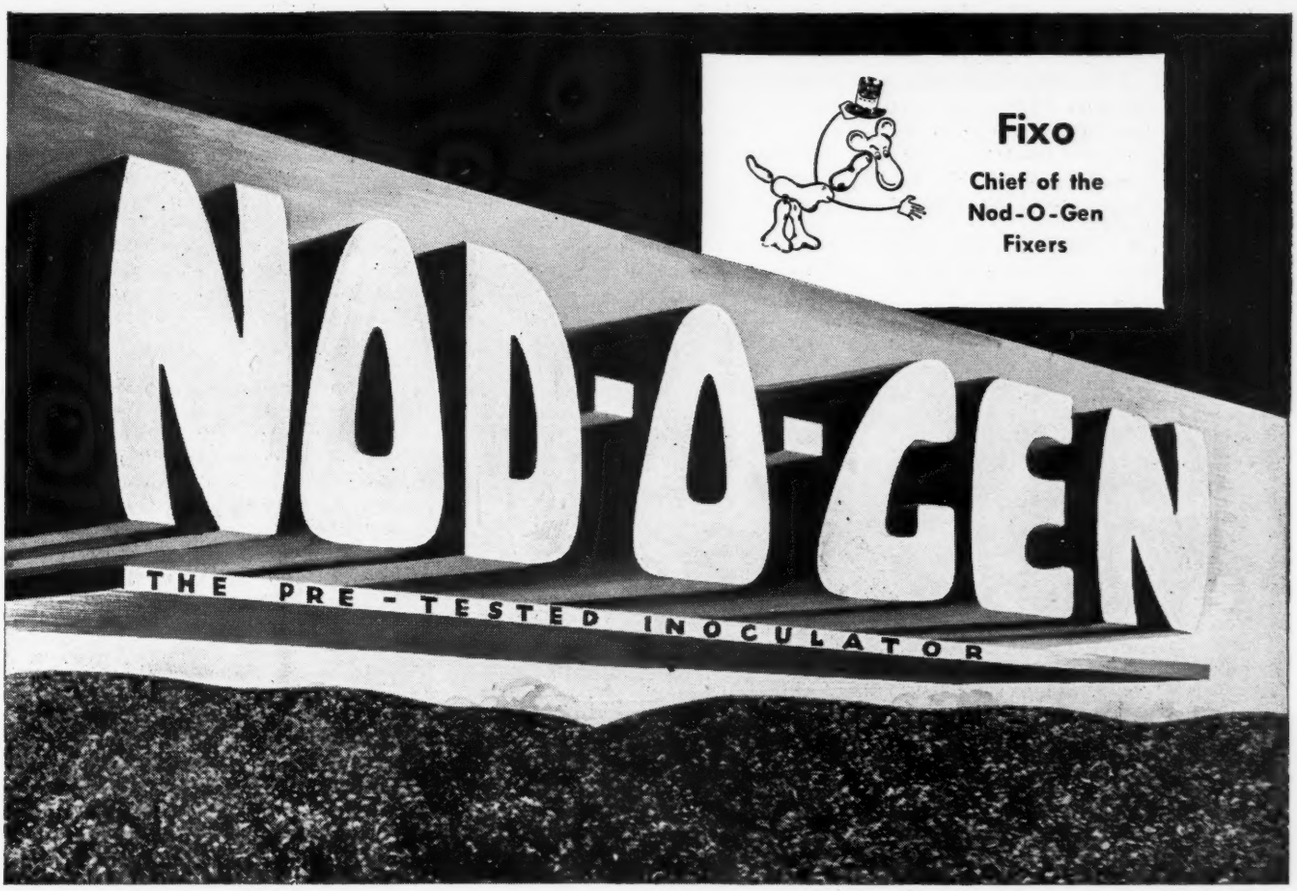
It would be impossible in a short talk, to even list the manifold uses of soy products in foods, so we will confine ourselves to staple everyday foodstuffs, giving briefly the percentages generally used and the most obvious improvements in the foods themselves.

"THE STAFF OF LIFE"

In spite of the vitriolic attacks of many self-styled nutritional experts, white bread still remains the most vital food element in the diets of civilized peoples, and daily reports from liberated areas show that this preference has only been accentuated by wartime shortages of white bread.

The progressive baker, whose business

Meat patties with soy flour.



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The Crop and Profit "Pepper Upper"

survival depends entirely on his ability to give the public what it wants, is very conscious of the importance of bread in our national diet, and has added many enrichening ingredients, sugar, fats, milk, malt and now, soy flour to his bread, in a sincere effort to give the Canadian consumer the most nutritious loaf in the world today.

Many more bakers would use soy, but it must be remembered soy is a concentrated flour, and roughly costs four times as much as wheat flour, which limits its use to those progressive bakers who are willing to sacrifice profits for quality.

In white breads the percentage used is from 1½ to 2 percent (1½ to 2 lbs. per bag of flour). This looks quite small percentage but recent research in Britain showed that 2 percent soy added to each bag of wheat flour increased the protein content of the bread by 20 percent.

In whole wheat, cereal breads, and yeast raised sweet goods, the percentages used are much higher, running from 5 to 10 pounds soy per bag of wheat flour.

In addition to raising the protein value of the breads and other baked goods, the adding of soy improves quality generally, by giving richer crust color, better crumb texture and generally lengthening the oven fresh shelf life of the goods, retarding staling.

In cakes, cookies, biscuits, doughnuts and other chemically aerated goods, the main advantage in using soy, apart from the food value angle, lies in its value as an emulsifier. Soy, if properly processed, contains percentages of lecithin, which enable it to help emulsify sugar, fats, etc., in cake making, improving the texture and keeping qualities. The antitoxant quality of the soy oil helps retard rancidity in all baked goods, reducing stale and rancidity losses.

MACARONI

In the field of staple foods, macaroni is, after bread, probably the most widely used food item. The only possible objection to this delicious food item, from a nutritional standpoint, is its low protein content. Catelli with characteristic initiative, have been checking the possibility of raising the protein content of macaroni products with soy, and after exhaustive tests, have now perfected a macaroni product with practically 100 percent increase in protein.

Mr. Samson, chemist and director of research in this progressive company, has also developed a product which may revolutionize the feeding of children. This product in granular form requires no cooking, and avoiding one of the main faults of such products, the minerals and vitamins are solely of natural vegetable origin, raw and thoroughly digestible by both children and adults.

This new baby food also carries soy as a protein supplement, and charts on child feeding with this product as against ordinary child diets, are consistently showing favorable results.

MEAT PRODUCTS

Although government regulations do not allow the free use of soy in sausages, due to the fact that soy and pork porteins are so similar that speedy analysis to determine the respective amounts of each in the finished sausage, is unfortunately not yet possible, preventing proper control; there is a good deal of soy being used in frankfurters, meat pastes and loaves, etc., replacing part of the starch fillers formerly used.

When we realize that most diets particularly in the low cost group are superabundant in starches, this higher protein content in soy-filled meat products would seem to be nutritionally desirable.

Apart from its binding qualities the use of soy in meat products, is largely on account of its ability to retain moisture during the processing, reducing shrinkage in the smoke house, and giving loaf goods a nice thin crisp crust, that cuts nicely.

FISH PRODUCTS

In the preparation of fish products, soy flour is being used to a small extent in fish pastes and the use of refined soy oil is becoming general in packing fish in oils.

The use of soy flour in coating fish fillets for frying is recognized by many famous chefs as giving a delicious brown

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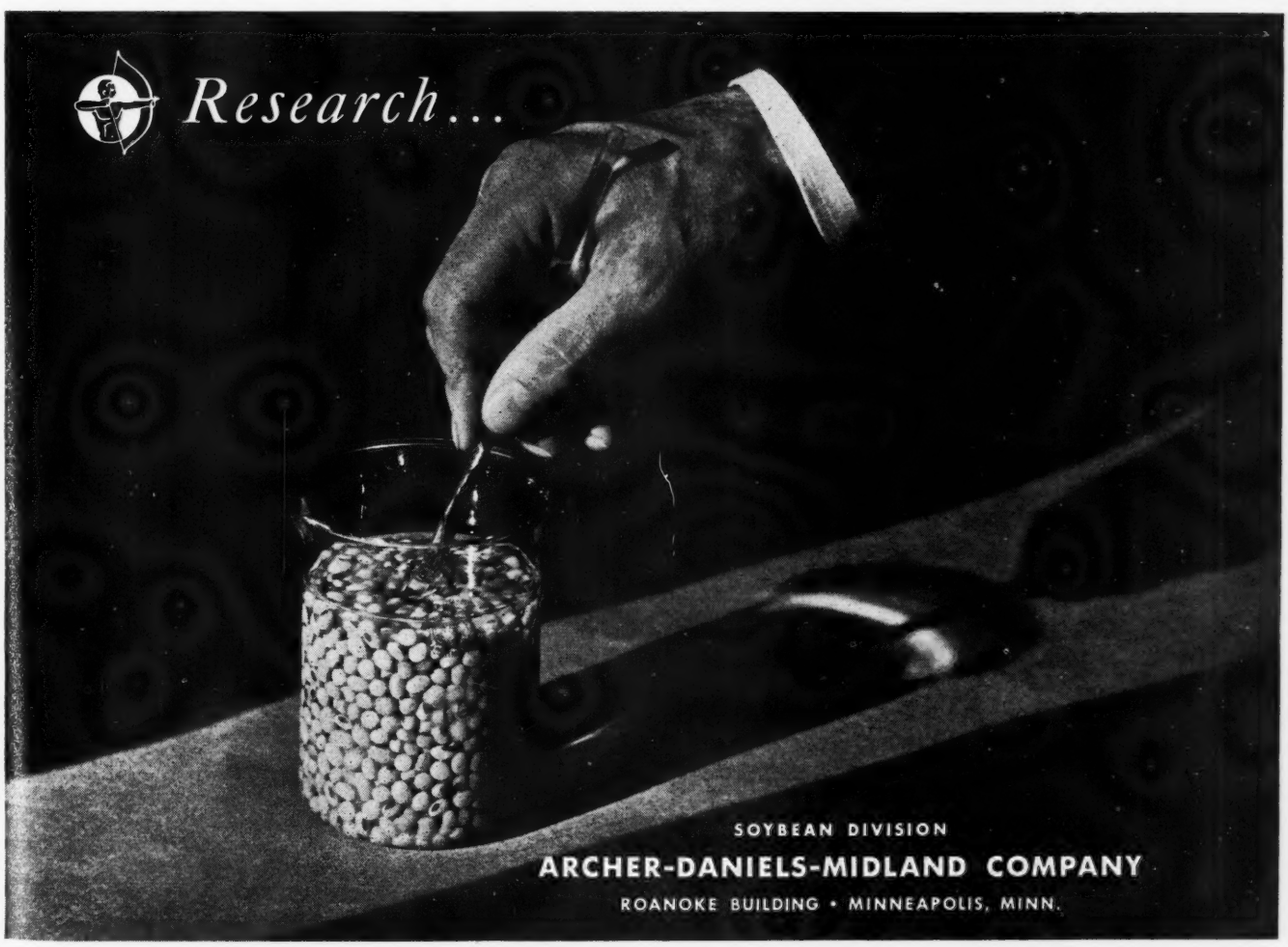

skin to the fillets and preventing their drying out.

Some enterprising fish processors will undoubtedly capitalize on the ability of soy to retain moisture and offer to the public fish fillets coated with soy flour ready for frying.

And so by its ability to raise the food value and increase the eye appeal and palatability of the goods, soy has found a place in the manufacture of the staple foods, bread, macaroni, fish and meat products.

MILK PRODUCTS

In the field of milk products very little progress in the use of soy has been reported. Experiments are being made using soy as a stabilizer and binder in certain types of cheese pastes and on the other side of the line, many delicious curds and soy milk products are available for those allergic to cows milk.

Perhaps one reason for this lack of interest here is that it is so easy to make soy milk at home. Simply take one part soy flour and emulsify it in six parts of cold water. Place in double boiler and bring to near boiling point, adding a pinch of salt and sugar. Take from fire and cool on ice. Add a little cocoa for soy chocolate milk.

SUPPLEMENTARY FOOD ITEMS

Dehydrated vegetable items, dry soup mixes and various milk chocolate and cereal drinks.

The value of soy as a stabilizer to retain the vitamin content and increase the protein value of these products, has been recognized by food processors. Most successful brands on the market today contain soy in one form or another.

In mayonnaise type dressings, the use of soy flour as a stabilizer and the use of refined soy oil as a base is going ahead steadily, and will probably increase in the postwar period when soy oil will be released from war work and made available to manufacturers of food products. Some soy spreads of the peanut butter types have been offered to the public, but they are still rather crude and a great deal of research is still necessary on these products. The best we have seen is a maple soy butter, which looks and tastes very good, and an almond paste has been selling well for some time.

FOR BEE FEEDING

A very interesting field for the use of soy has been developed by the Department of Agriculture in recent years, in the feeding of bee colonies in the winter months, when natural pollen is unavailable.

A mixture of specially processed soy, sugar and water has proven a very acceptable pollen supplement. Bee farmers predict an increase in the yield of honey by this means.

In candy and confectionery, which very definitely must be regarded as a food item, the use of soy is steadily increasing. First regarded as a substitute for milk solids, it was soon noticed that the use of soy gave very definite improvements in certain types of confectionery, reducing the boiling time, preventing the sweating of the goods in storage and giving a refreshing difference in eating qualities of certain types of caramel.

Soy has a certain natural sweetness which blends well with fudge type products and many experienced candy men have expressed the conviction that soy has now become a regular ingredient in candy making.

EMERGENCY RATIONS

The emergency ration biscuit, developed for the life saving kit for the Canadian Navy, has possibilities in the postwar period.

The biscuit contains roughly in each pound, 2,500 food calories and the normal mineral and vitamin requirements of the human body and requires only water or milk to give adequate nourishment.

Tests are being made by the Mercantile Marine with the view of having all life boats equipped with this product to replace the hard tack formerly used.

The formulae will be released to food manufacturers after the war is over and the product will then be available to the general public, prospectors, etc., or as a supplementary food unit for dyspeptics or those affected with tuberculosis etc., where supplementary feeding is desired.

For those ladies who are vitally interested in weight control, the fact that soy contains no starch and that its introduction to foods reduces their starch content, should be interesting and its addition to those so-called reducing diets would remove the danger of malnutrition.

Nutritional Appeal Won't Sell Soy

Sales appeals that stress the nutritional value of soy foods may actually decrease their use by the American public. This caution is voiced by the committee on food habits of the National Research Council at Washington, D. C., after a recently completed study. The report is made by Patricia Woodward, associate executive secretary of the committee.

The Council had exceptional opportunity to study the effectiveness of different sales appeals in introducing soy foods to the customers of the six identical cafeterias in the Pentagon building at Washington, D. C.

Over a period of six weeks a different food containing soy flour or grits was served each day Tuesday through Saturday in the six cafeterias. The dishes served were soya apple cobbler, soya meat loaf, soya muffins, soya macaroni and cheese, split pea and soya soup. Not enough soy was used to alter the flavor of the dishes.

Identical food was served in all restaurants. The only difference was in the sales appeals, which were carried on colorful posters prominently displayed. Various combinations of the following appeals were used:

1. Soybeans have high nutritional value, as determined by scientists.
2. Soybeans are American.
3. Soy offers good value for the money.
4. Soybeans can be used in a wide variety of ways.

The committee was interested in soy foods, Miss Woodward reports, "because they were a new food, not widely used by people in any part of this country as food, and offered an unusual opportunity to observe the ways in which a new food is incorporated into the American diet. Such completely new foods are relatively rare . . ."

A thousand customers, two-thirds of them women, were checked each day for four weeks in each of the six cafeterias on their response to the different appeals, a wide cross-section on which to base a conclusion.

Of four combinations of appeals the one stressing thrift, variety and the fact that soy foods are American, but omitting any mention of nutrition, was most effective. This appeal brought about increased consumption of soya meat loaf by both men and women, and soya macaroni and cheese by the women.

The least effective was the appeal stressing nutrition alone. This actually accounted for a *decreased* consumption of soya meat loaf and soya muffins by the women.

The committee believes that people are apt to assume that foods that are healthful do not taste good. This "is of course quite a different matter from talking about the nutritional value of a food which is *already* familiar and well accepted," says Miss Woodward. "In the latter case, the nutritional value is just one other characteristic of the food, and is likely to be considered an additional point in its favor."

An earlier study of the National Research Council committee was reported in the May 1944 issue of the *Soybean Digest*.

Eager Beaver

★ GROWERS ★

Contour Cuts Loss

More rainfall stays in the ground to nourish crops, less soil is washed away and yields consistently are higher when contouring is practiced instead of up-and-down hill planting.

Tabulations of experiments conducted by the Iowa Agricultural Experiment Station at Iowa State College and Soil Conservation Service on the experimental farm at Clarinda in 1943 and 1944 prove this statement.

In 1944, when rainfall for the year totaled 39.24 inches, the runoff of water for corn listed in 40-inch rows on up-and-down hill plots was 11.2 percent—exactly twice as much as on the contoured area where it was only 5.6 percent, while the loss of soil was 51.5 tons on the up-and-down hill rows as compared with only 10.2 tons per acre on the contoured rows.

On soybeans runoff ranged from a low of 3.6 percent for contoured soybeans drilled solid in 7-inch rows to an 8.3 percent runoff for soybeans surface planted up-and-down hill in 40-inch rows. Soil losses for surface-listed beans ranged from 5.9 tons per acre for the contoured soybeans to 18.8 tons per acre when planted up-and-down hill.

Louisiana Varieties

In the 7-year period 1932-1939 (except 1937), approximately 60 soybean varieties and selections were grown in replicated row plots in rotation with other cultivated crops at the Rice Experiment Station, Crowley, La., reports J. Mitchell Jenkins, in Louisiana Bulletin No. 383, August 1944. Each year, approximately 400 pounds per acre of a complete fertilizer was applied to the land. In the past 10 or 15 years, for some unaccountable reason, very unsatisfactory yields of soybean seed have been produced on the Station. In the first 10 or 15 years after the Station was established, soybeans produced an abundance of normal seed. Since that time, insects have become more damaging, especially the velvet bean caterpillar; also diseases, and apparently other causes, have prevented the normal setting of seed. Because of this fact, no attempt was made to estimate seed yields, but the estimated yields of cured hay for 12 varieties are given. The yield of cured hay was estimated from the weight of green forage cut soon after the plants flowered.

In the 4-year period (1932-35), the average yield of cured hay was for Otootan 3012 pounds, for Biloxi 2778, for Laredo 2676, and for Barchet 2262 pounds per acre. The highest average yields for the years 1936, 1938, and 1939, was for Avoyelles 3588 pounds, for Palmetto 3473 pounds, for Monetta 3112, and for U. S. 71570 the average yield was 3023 pounds per acre. Each of these varieties produced higher average yields of cured hay than Barchet. However, Barchet was the most dependable variety for seed production.

In the 11-year period from 1932 to 1942, approximately 60 soybean varieties and selections were grown. Because of damage from insects, diseases and other causes, the setting of seed was so poor that yields were not recorded. In yields of cured hay for the 4-year period 1932-35, Otootan, Biloxi, and Laredo ranked in the order given. Of the varieties grown for a period of 3 years (1936, 1938, 1939), Avoyelles ranked first in yield of cured hay with Palmetto, Monetta, and U. S. 71570, ranking second, third, and fourth, respectively. Barchet was the most consistent variety in the production of seed.

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VIRGINIA

(Continued from page 8)

favorably with that of the same variety grown in the Midwest: and in many instances, was slightly higher.

At Holland, (peanut-cotton section of Virginia) a yield of 47.9 bushels per acre was harvested from Ogden, while Volstate produced 46.6 bushels per acre in 1943. Both of these varieties have satisfactory oil analysis. In this section of Virginia, a great many soybeans are grown in combination with corn for hogging purposes. In fact, this mixture is always used, in addition to hogging up peanuts left in the soil after harvest, in the production of pork for the famous Smithfield products. Experiments conducted at Holland show that in this section, the planting of one peck of soybeans per acre in the same row as the corn has not reduced the corn yields under normal weather conditions.

Since the soybean is a summer crop, it may be substituted for practically any summer crop in rotation or added to them. In a great part of Virginia, soybeans are followed by small grain; in which case, the variety chosen must mature in time to permit harvest before the normal small grain seeding time. In eastern Virginia, the soybean crop may be followed by cotton or corn; or in other cases, soybeans follow early potatoes occupying the land the same year.

Annual and average of yields of cured hay for 12 soybean varieties grown at the Rice Experiment Station, Crowley, Louisiana, for the years 1932 to 1939, inclusive*

Variety	Yield of Cured Hay in Pounds per Acre							Average	
	1932	1933	1934	1935	1936	1938	1939	4 years 1932-1935	3 years 1936, 1938, 1939
Otootan	3896	2304	3040	2807	2478			3012	——
Biloxi	2052	3330	3272	2459	2091			2778	——
Laredo	2512	2885	3388	1917				2676	——
Mammoth Yellow	1684	1994	3233						——
Barchet	1694	2962	2788	1604	1742	2718	3514	2262	2658
Delsta			3117	2478	2401				——
Tokyo			3465	2188	2091	2556	3398		2682
Mamloxi				1568	1936	883			——
Avoyelles					2865	3601	4298		3588
U. S. 71570					2168	3067	3833		3023
Palmetto					2788	3624	4008		3473
Monetta					2284	2927	4124		3112

* None seeded in 1937.

Need New Varieties for Wyoming

From Bulletin 267, Agricultural Experiment Station, Laramie, Wyo.

Higher yielding varieties of soybeans will have to be developed before their commercial production can be justified in the high altitudes of much of the state of Wyoming, reports W. L. Quayle, director of the experiment farms at the University of Wyoming.

Livestock feeders in Wyoming have become interested in soybeans because of the increasing use of soybean oil meal in feeding operations. The possibility of growing an acreage sufficient to justify the building of processing plants within the state has been considered by both farmers and livestock feeders.

Growing trials were conducted at four stations and substations in Wyoming over varying periods from 1923 through 1943. These were under irrigation and by dry-farming methods on soils varying from a heavy clay loam to a light sandy loam.

The extremes in altitude for the different locations vary from 3,700 feet to 6,200 feet. The seed for the several trials came from midwestern states, except at Torrington, where home grown seed was used from 1941 to 1943, in addition to the seed produced in other states. In 1942 the U. S. Department of Agriculture furnished seed of 20 early varieties which was planted at the Afton and at the Torrington stations. Ordinary cultural practices and irrigation methods, such as are used in the production of field beans, were employed in the growing of the soybeans on the several stations.

On a medium heavy loam, at the Sheridan Field Station where the altitude is 3,800 feet and the frost free period is 118 days, the highest five-year average yield, 1938-1942, was 5.03 bushels per acre and the highest yield of air dry forage was 1,147 pounds per acre.

A two-year test at Worland on a heavy clay loam where the frost free period is 130 days and the altitude is 4,100 feet, gave yields from 5.33 to 14.08 buhsels per acre on spring plowing. The highest air-dry forage yield for one year, 1930, was 6,000 pounds per acre.

In a one-year test with early varieties on a gravelly loam, at Afton, with an altitude of 6,200 feet and an average frost free period of 43 days, only one variety, Sioux, had set pods by September 3, the date of the first killing frost.

On the Torrington station, with an altitude of 4,100 feet, on a light sandy loam where the frost free period averages 117 days, a number of soybean varieties gave satisfactory yields. The highest yield, 26.5 bushels per acre was produced by Soysota. Although the yield from this variety was next to the lowest in 1943, yet its average four-year yield, 17.0 bushels per acre, was next to the highest of the varieties tested for that period. The highest yield of the entire test was recorded for Cayuga, 27.3 bushels per acre in 1942 from eastern seed. The highest four-year average yield, 17.4 bushels per acre, was produced by Wisconsin 606.

The results of these tests indicate that at high elevations the soybean varieties that were tried are not well adapted to the cool temperatures and short growing seasons. Under conditions similar to those at Torrington, the soybean varieties made much better yields.

The four-year average of Great Northern beans at Torrington was 146 percent greater than the highest average yield of soybeans.

The cost per acre of producing the two kinds of beans is approximately the same, but the average selling price of soybeans in the United States, 1931-43, was less than half the price received for edible beans. Under these conditions, higher yielding varieties of soybeans will have to be developed before their use as a commercial crop in this part of the state can be justified.

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A. E. Staley Manufacturing Company, Decatur, Ill., has tied in the sale of its Stoy Soy Flour, Cube Starch and Cream Corn Starch with the offer of 12 high grade giant tulip bulbs which are sent in return for 25 cents and a box top from any of those three products.

DEBITTERING SOYBEANS

• *A list of patents for removing the bitter taste from soybeans.*

By A. K. SMITH

Oil and Protein Division Northern Regional Research Laboratory 1/, Peoria, Ill.

U. S. PATENTS

1,314,298—August 26, 1919. Process of deodorizing and decoloring bean-flour. Yoshitaro Yamamoto — After hulls are removed beans are steeped in dilute vinegar solution at 60° C., washed, steeped in bicarbonate, washed and dried.

1,433,168—October 24, 1922. Odorless and colorless soybean flour. Yoshitaro Yamamoto, C. A. 17: 316 — Coarsely pulverized soybean material is treated with very dilute acetic acid to remove the odor and remove the color. The oil is then extracted from the bean material and ground to a flour.

1,509,076—September 16, 1924. Treatment of soybeans. Laszlo Berczeller — Subjection of soybeans to steam or saturated steam for a short time.

1,615,822—February 1, 1927. New food and process of production. Roland P. Baile — Beans are soaked in water, then immediately introduced into boiling peanut oil.

*1,799,256—April 7, 1931. Apparatus for treating soybeans. Teikichi Satow — Description of a drum type of equipment for removing the oil and baking the beans to improve their taste.

1,850,095—March 22, 1932. Extraction of oil from vegetable material. F. P. Dengler to Lloyd M. Brown — Beans are treated at 180° F. with dilute ammonia solution and superficially dried prior to the oil extraction.

1,867,541—July 12, 1932. Process of manufacturing soybean flour. W. L. Shellabarger, assignor to Shellabarger Grain Products Company, Decatur, Illinois. C. A. 26: 4657 — Process of treating beans with steam between 120° to 140° F. followed by a vacuum treatment at 24 inches of mercury.

1,870,450—August 9, 1932. Method for improving and removing the odor and/or flavor of legumes. L. W. Haas and H. O. Renner, assignors to J. R. Short Milling Company, Chicago, Illinois—The beans are reduced to a flour and treated with an aldehydic reducing agent such as formaldehyde.

1,896,520—February 7, 1933. Process for the manufacture of a disembittered product of wheat germ. Ernst Komm Dresden-Weisser. Hirsch, Germany—Wheat germs are mashed in an atmosphere of carbon dioxide and then subjected to steam distillation to remove the bitter principle.

1,896,521—February 7, 1933. Process for obtaining high-valued nutrient from the products of cereals and legumens. Ernst Komm, Dresden-Weisser. Hirsch, Germany—A method of producing a food product rich in vitasterenes and vitamines by mashing in water a grain byproduct rich in cellulose and bitter principle, adding a diastasic substance, and passing steam through the liquid at a controlled rate to prevent destruction of the vitamins.

*1,912,895—June 6, 1933. Process for converting soya beans and the like seeds into a condition suitable for nutrition. Fritz Gossel of Frankfort-on-the-Main, Germany—Treatment of soybeans with oils at 100° C. for 5 minutes and the removal of excess oil with a centrifuge.

1,914,478—June 20, 1933. Bread-leavening composition. Michele Bonotto, assignor, to American Soya Products Corporation, Evansville, Indiana—Calcium and alkali phosphoproteinates are used with protein and yeast to leaven bread.

*1,936,281—November 21, 1933. Process for disembittering and improving soya beans or like legumes. E. C. Winkler and Hubert Goller, Vienna, Austria, assignors to American Soya Products Corporation, Evansville, Indiana. The soaking of beans in water at a pressure other than atmospheric at a temperature between 65° and 80° C. During the process the seed coat acts as a semi-permeable membrane to remove undesirable constituents.

1,973,281—September 11, 1934. Process for making vegetable product. Michele Bonotto. C. A. 28:6880. To improve color and taste, the beans are soaked in a solution of SO_2, then heated and subjected to a current of steam to liberate the SO_2.

1,980,838—November 13, 1934. Process for treating fat and oil-bearing seed products. G. P. Trussaud, assignor to Arnold R. Boyd, New York, New York. Treatment of oil-bearing seeds by a process which involves soaking them in water and heating the water-soaked seeds between 110° C. and 140° C. in the presence of sulfur dioxide.

2,000,317—May 7, 1935. Soybean flour. W. B. Bishop, assignor to A. E. Staley Manufacturing Company, Decatur, Illinois. Normal moisture content is increased; beans are subjected to high temperature and dried at reduced temperature. After oil is expelled, the beans are ground to flour.

2,026,676—January 7, 1936. Treatment of soybeans. L. O. Gill, assignor to A. E. Staley Manufacturing Company, Decatur, Illinois. The moisture content of beans or broken parts is increased to about 20 percent. Beans are heated at a temperature above the boiling point of water, and then dried at low temperatures.

*2,052,215—August 25, 1936. Process for producing a soya flour with changed flavor and the products thereof. Martin Cohn, assignor to M. Neufeld and Company, Berlin, Germany. Beans are soaked for about two hours at a temperature of about 75° C. in water weakly acidulated with hydrochloric, sulfuric, or phosphoric acids.

2,101,805—December 7, 1937. Process of treating leguminous materials. Michele Bonotto, assignor to American Soya Products Corporation, Evansville, Indiana. C. A. 32:1132. To improve the color and taste of soybeans they are treated with a

1/One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.

.02 percent to .25 percent solution of sulfur dioxide and washed in water.

2,086,180—July 6, 1937. Process for removing solvent from solvent-treated material. Michele Bonotto, Evansville, Indiana, assignor to American Soya Products Corporation, Evansville, Indiana. Live steam is passed through soybean flakes in a solvent extraction process to remove the solvent.

2,086,181—July 6, 1937. Apparatus for the continuous treatment of soybeans with sulfur dioxide solution. Michele Bonotto, assignor to American Soya Products Corporation, Evansville, Indiana. C. A. 31: 5895. The continuous treatment of soybeans with sulfur dioxide followed by water washing.

2,117,315—May 17, 1938. Treating soybeans. Fritz Gossel, assignor to General Soya Corporation, New York, New York. Moisture content of the beans is adjusted to 10 and 15 percent, then beans are coated with oil and heated in a gaseous atmosphere to effect removal of objectionable constituents.

2,146,958—February 14, 1939. Process of removing objectionable smell or taste from flour or similar ground products. Alois Kotera, Prague, Czechoslovakia, assignor to Carob-Nont-Union Verwaltungs-Gesellschaft in b. H., Frankfort-on-the-Main, Germany. To improve taste and odor, food products are mixed with about .01 percent of finely divided activated carbon.

2,147,097—February 14, 1939. Improving the palatability of soybeans. A. A. Horvath, assignor to Soya Corporation of America, New York, New York. C. A. 33:3914. Beans are subjected to a gas (CO_2) at 1 to 60 atmospheric pressure and 0 to 40° C. The gas is expelled to improve flavor and taste.

2,148,142—February 21, 1939. Process of debittering soybeans. R. A. Wait, assignor to Spencer Kellogg and Sons, Buffalo, New York. C. A. 33:3914. Soybeans are treated in a drum with a combination of ethylene and steam diluted with carbon dioxide or nitrogen.

*2,172,699—September 12, 1939. Food production from oleaginous seeds such as soybeans. Martin Cohn. C. A. 34:542. An apparatus and process are described for swelling the seeds in water and pressing them into skinlike films. This is done by forcing the seeds under pressure through a very narrow gap between heated, revolving surfaces, one of which retains the film until dry.

2,182,175—December 5, 1939. Method for the preparation of leguminous foodstuff. R. G. Gates, assignor to C. L. Wickersham, Sharpsburg, Pennsylvania. Beans are ground to flour, steamed and mixed with sugar materials and starchy products to make a precooked food product which is then shaped and toasted.

2,260,254—October 21. 1941. Process for making soybean products. N. F. Kruse and W. L. Soldner, assignors to Central Soya Company, Inc., Fort Wayne, Indiana. Moisture content of the meal is increased to between 15 and 30 percent, then beans are cooked at a temperature above the boiling point of water while the meal is kept in motion.

2,267,747—December 30, 1941. Dehulled, disembittered, and expanded soybeans and process for producing same. William J. Plews, Chicago, Illinois, assignor to Plews Process, Inc., New York. A puffed soybean is produced by treating it with a steam pressure between 50 and 300 lbs./sq. in. and suddenly releasing the pressure.

2,316,458—July 12, 1940. Method of preparing soybeans. Oreste Scalise, New York, New York. Soybeans are processed by being soaked in a solution of sodium chloride and flavoring agent. They are then fried in hot oil until the moisture in the beans is 2 or 3 percent.

2,322,516—June 22, 1943. Fixation process. A. A. Horvath, assignor to Horvath Laboratories, Inc., Chambersburg, Pennsylvania. A method of fixing undesirable substances in the skin and germ of the whole soybean. The beans are treated with iron, calcium or magnesium salts until they penetrate the palisade layer and hilum. The treated soybeans are then heat-tempered.

2,329,080—September 7, 1943. Method of treating soybeans. Charles A. Raymond, Marion, Ohio. Beans are soaked in water, boiled in sodium bicarbonate, washed, soaked in ammonium bicarbonate 4 hours, heated to slightly above 212° F., and finally cooked in hot oil at 220° to 230° F.

BRITISH PATENTS

212—January 2, 1914. Deodorizing soybean material. J. Friedman, C. A. 9:1643. A process for decorticating, grinding, heating beans in dry heat with continuous stirring to carry off the moisture and flavor.

179,776—April 1, 1921. Treating soybeans. Y. Yamamoto and I. Mizusawa. C. A. 16:3371. Beans are coarsely ground, treated with acetic acid, washed and dried. Oil is expressed.

367,082—February 18, 1932. Treating soybeans and similar leguminous seed. Fritz Gossel. C. A. 27:4332. The beans are treated with oil to prevent oxidation when heated to improve the flavor. After the heat treatment the excess oil is removed by centrifuging.

367,865—February 25, 1932. A process for preventing the oxidation of soybeans and bran obtained therefrom. Landislaus Berczeller.

385,657—January 5, 1933. Process for disembittering and improving soybeans or like legumines. E. C. Winkler and H. Goller. C. A. 27:4600. Similar to U. S. Patent 1,936,381; also see French Patent 727,771.

393,146—June 1, 1933. An improved process for treating soybeans. Landislaus Berczeller. C. A. 27:6001. Beans are subjected to the alternate action of steaming and drying.

397,482—August 21, 1933. Treating soybeans. M. Bonotto. C. A. 28:1116. Beans are placed in an SO_2 solution until saturated with the gas, then heated moderately to expel the SO_2.

397,692—August 31, 1933. Soybean flour. W. L. Shellabarger, assignor to Shellabarger Grain Products Company. See U. S. Patent 1,867,541.

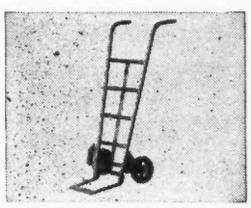
"SEEDBURO Sure Has GOOD EQUIPMENT"

. . . that's what thousands of grain and seed men are saying. The picture at the right shows Mr. J. V. Paulson, operator of the Odebolt Co-op Elevator Company, and Mr. Albert Weitzel, farmer near Early, Iowa, operating the Steinlite Moisture Tester.

The Seedburo line includes over 350 items. All adhere to Government standards where specifications are available. All are precision built, rigidly inspected, fully guaranteed. Write for circulars on items that interest you.

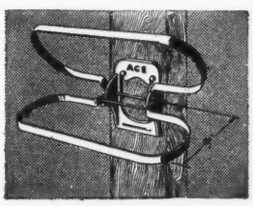
THE STEINLITE ONE MINUTE MOISTURE TESTER

The Steinlite is the most popular rapid tester on the market for determining the moisture content of whole and processed grains. It is EASY TO USE . . . like tuning a radio. The Steinlite operates on the radio frequency impedance principle, and is checked against official oven methods. No technical knowledge is necessary. With practice you can make a test in one minute. Sold on 10-day free trial basis. No money down. Available for immediate shipment. Price $275. F.O.B. Atchison, Kansas.



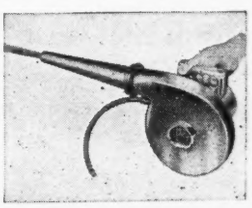
TUBULAR STEEL BAG TRUCK

65AR—A light truck popular with grain and seed dealers. Constructed of tubular steel, all joints welded. 7-inch diameter wheels, rubber tires, roller bearings. The 9-inch nose makes it very useful in handling large, bulky sacks and boxes. Handles 48 inches in length. Price $22.00. Other sizes available.



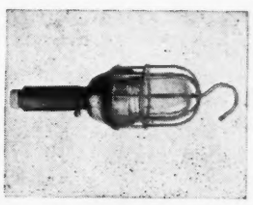
SEEDBURO BAG HOLDER

Speed up your work of filling bags. One man can operate. Opening at top is 15 inches long by 6½ inches wide. Big enough to shovel into without spilling over the side, because the bag is held firm and smooth. Everything goes inside. Weighs only 4½lbs. When not in use can be folded up and hung out of the way. Can be set up wherever you can drive two ten-penny nails. Price $3.00



PORTABLE ELECTRIC BLOWER

Model 8A — Keep motors, machinery, line shafting and other equipment free from fire hazard dust with a Seedburo Portable Electric Blower. 3/5 H.P. motor. Easily converted into sprayer or industrial vacuum cleaner. Far more powerful than other blowers and durably constructed for many years of trouble free service. Price, $71.50. Attachments extra.



PORTABLE LAMP GUARD

Listed as standard by Underwriter's Laboratories. Every necessary precaution has been taken in the manufacture of this Guard to make it safe for use in the presence of grain dust or inflammable materials. Has 10 outstanding features that make it worth every dollar it costs you. No. 386 Lamp for 50 watt bulb, Price $5.00. The price shown does not include any cable. Cable, per ft., $0.10.

629 BROOKS BUILDING CHICAGO 6, ILLINOIS

SEEDBURO EQUIPMENT COMPANY

Formerly SEED TRADE REPORTING BUREAU FOUNDED 1912

407,866—March 29, 1934. Improvements relating to the process of producing soya flour. E. Neufeld and Hugo Heymann. C. A. 28:5551. Soybeans are soaked in slightly acidulated water at an elevated temperature but not above 75° C. Next the beans are washed several times with water, ground and roasted with periodical interruptions of the heat supply.

452,682—August 27, 1936. Treating animal and vegetable materials. Willey Ekhard. C. A. 31:1155.

510,375—August 1, 1939. Soybean flour. British Arkady Co. Ltd. and Alan M. Maiden. C. A. 34:5195. The objectionable flavor is removed by heating the flour between 90° to 150° F. and maintaining it at this temperature without reducing its moisture content below 4 percent until the flavor is removed. The flour may be treated wholly or in part with ammonia prior to or during the heat treatment.

517,997—February 14, 1940. Improvement in or relating to the treatment of soybeans. William J. Plews. C. A. 35: 7054. Soybeans are heated with steam to a high pressure; the pressure is suddenly reduced causing removal of the hulls.

FRENCH PATENTS

708,394—March 28, 1931. Process of treating soybeans for food purposes. Fritz Gossel.

727,771—June 24, 1932. Removing the bitter principles from soybeans. E. C. Winckler and Hubert Goller. C. A. 26: 5675. The bitter principle is removed by diffusion with water.

728,594—December 1, 1931. Vegetable materials. Soya Products, Inc. C. A. 26:6034. Soybeans are treated with sulfur dioxide and then washed in an aqueous solution to remove the acid and colored substances.

740,470—January 26, 1933. Process for manufacture of soy flour with improved taste. M. M. Cohn.

742,986—March 21, 1933. Vegetable products. Ladislaus Berczeller. C. A. 27:3760. Products are submitted alternately to the action of steam and partial drying.

745,299—May 8, 1933. Process for manufacture of soy flour. Shellabarger Grain Products Company. C. A. 27:4321.

841,296—May 15, 1939. Improvement in the preparation of soybeans. A. A. Horvath.

GERMAN PATENTS

31,391—July 10, 1886. Process for debittering legumes and other seeds. Paul Saltsien. The bitter materials are removed from seeds by treatment with aqueous or alcoholic solutions containing 6 to 10 percent of ammonia.

406,170—November 15, 1924. Process for treatment of soybeans for food purposes. Ladislaus Berczeller in Vienna and Robert Graham in Cupra-Fife, Haymount, Schottf.

536,178—October 17, 1931. Preparation of protein-rich baked products. Friedrich Passek.

542,302—June 18, 1930. Working up lupines and other legumes. Otto C. Strecker. C. A. 26:2255.

626,405—February 26, 1936. Process for debittering and improving soybeans or similar legumes. Carl Winkler. C. A. 30:3539. See French Patent 727,771. C. A. 26:5675.

644,673—May 10, 1937. Process for the manufacture of soybean flour. Shellabarger Grain Products Company.

670,679—January 21, 1939. Improving soybeans. C. A. 33:6470.

713,621—October 16, 1941. Soybean flour. Richard Hempel. C. A. 38:1811. Soybeans are treated with acidulated water at 70° to 75° C., then dried and ground.

SWISS PATENTS

121,554—January 30, 1926. Soybean and soybean meal as human food. Otto Czadek.

172,720—January 16, 1935. Improving soybeans. Ernst Lieberherr. C. A. 29: 5539. Leguminous seeds are heated without oxidation to break down the glucoside substances they contain. The heating is carried out by heating the seed in oil or fat.

AUSTRIAN PATENTS

106,346—April 25, 1927. Process for improving soybeans. Ladislaus Berczeller.

124,999—July 15, 1929. Working up soybeans. Ladislaus Berczeller. C. A. 26:785. The deoiled soybeans are treated with steam.

126,155—August 15, 1931. Treatment of soybeans to remove beany flavor. Hubert Goller and E. C. Winkler. C. A. 26:2255. Beans are treated with water at 65° to 75° C. at raised or reduced pressure to remove bitter constituents and carbohydrates.

JAPANESE PATENTS

34,949—September 15, 1919. Deodorized and bleached soybean flour. Y. Yamamoto, I. Mizusawa, and T. Kano.

Printed copies of U. S. patents are furnished by the Patent Office, Washington, D. C., at 10 cents each. Photostatic copies of foreign patents may be obtained at 20 cents per page. In ordering foreign patents, the year as well as the number must be furnished the patent office. The patents marked with an asterisk are in the group of patents in the possession of the Alien Property Custodian.

★ GRITS AND FLAKES ★

FROM THE INDUSTRY

Two interesting new booklets just published by the J. I. Case Co., are "How to Produce High-Protein Hay," and "Advanced Farm Practices." Both booklets have plenty of pictures. The first covers the operations of growing, cutting, curing, storing and baling hay. The second takes up a wide variety of subjects including diversification, livestock farming, pasture management, pond construction, stubble mulch tillage, contour farming, terrace building, soil building rotations, ensiling feed crops, and machine care and selection. Case has issued seven soil conservation booklets since 1941.

Ken J. Maltas has been appointed assistant manager of the A. E. Staley Manufacturing Co. grain department. The Staley firm, which is located at Decatur, Ill., is one of the largest processors of soybeans in the nation. Mr. Maltas has been with the Staley firm for 18 years and was formerly its sales representative in western territory. In 1937 he was named western sales manager and moved to Decatur. N. M. Crain, assistant to Mr. Maltas, is the new western sales manager.

Henry D. Egly has announced his resignation as manager of the A. E. Staley plant at Richmond, Ohio and effective May 1, he joined the Victory Mills, Ltd., Toronto, Ont., a subsidiary of the Canadian Breweries, Ltd. The Victory Mills has just recently started operating a new soybean processing plant. Replacing Mr. Egly as manager of the Staley plant is Thomas Longbons, his assistant. New assistant to Mr. Longbons is James Creel.

Plans are being made for construction of a new soybean processing plant in Janesville, Wis., according to Ralph Wells of Monmouth, Ill. Work on the building is expected to be started in October. The new plant will have a capacity of 1,500 to 1,800 bushels of soybeans per day

—s b d—

NOW SEEDBURO'S REPRESENTATIVE

C. J. (Abie) Polstra is now Seedburo Equipment Co.'s full time representative in the firm's Indiana territory. For several years Abie devoted a part of his time to Seedburo in the northern portion of the state. Now he will devote his entire time to Seedburo and will cover the entire state of Indiana.

Before joining Seedburo, Mr. Polstra was with the Century Co., Chicago, for nine years, calling on the grain and feed trade. He later became associated with Polk's Products, Inc., Indianapolis, Ind., as sales manager for Indiana and Illinois.

The Seedburo line now includes over 350 items of grain and seed house supplies and equipment, and many new items are being added.

C. F. MARSH TO GLIDDEN'S

Cecil F. Marsh has succeeded Peter Turner as general sales manager of the Glidden Co.'s feed mill division at Indianapolis, Ind., Mr. Turner having retired from the Glidden organization, it is announced by P. E. Sprague, vice president, at the executive offices at Cleveland, Ohio.

Mr. Marsh is well known in the feed industry from his long association in sales and distribution capacity with the Albert Dickinson Co., and the McMillen Feed Mills and will consequently bring to this new responsibility a well recognized background of experience and achievement.

The conversion of the buildings and equipment at the former Indianapolis plant of the American Cereal Corporation, which were acquired by Glidden from and at the request of the Reconstruction Finance Corporation at an investment of upwards of a million dollars, into a modern mixed feed manufacturing unit during wartime conditions involved many problems which have been successfully solved.

The completion of this mixed feed plant brings to realization plans contemplated by the Glidden Co. for a number of years since its operations in the crushing of oil seeds and the processing of soybeans assumed their present substantial proportions. The objective was to establish a first-quality mixed feed business built on the scientific basis of nutritional research developments. The successful manufacture of soybean products for the industrial field and for the edible food field in which Glidden has been a pioneer has brought to light opportunities for the production and utilization of ingredients hitherto unavailable for livestock and poultry feeds.

The Glidden Co. has been for many years a producer of vegetable oil meals and also of both crude and refined vegetable oils at the crushing plants of its Durkee Famous Foods Division. Before the war Durkee was a crusher of copra in plants located at Berkeley, Calif., and at Portland, Ore., and just prior to the war completed a new crushing plant at Buena Park, Calif., which has been producing linseed and soybean oil meal.

All of the edible oils produced are consumed by the Durkee Famous Foods Division of The Glidden Co., and a substantial part of the linseed oil is consumed by the company's nine paint plants operating in various parts of the country.

All of the meals are consumed in the manufacture of mixed feeds.

The company's soybean processing operations are conducted in a large plant at Chicago where both the 41 percent expeller meal and 44 percent extracted soybean meal are produced in substantial quantities.

It pays to be a Bemis Customer

BEMIS BAGS

BEMIS BRO. BAG CO.
Saint Louis
Better Bags Since 1858

The full resources of materials, manufacturing and fine printing of 14 textile bag plants and 6 heavy duty paper bag plants—strategically located from coast to coast—are behind every Bemis contract.

East Pepperell, Mass.

WASHINGTON Digest

What About Tariffs?

The U. S. Tariff Commission has just completed a study, ordered by Congress, on the effects of higher, lower, or unchanged tariffs on international trade, including fats and oils, and its findings have been transmitted to the Senate Finance Committee for guidance in future tariff legislation.

The fats and oils section sets forth results of the study based on the following hypotheses:

1. What will be the effects on fats and oils imports and exports if tariff rates are *decreased* 50 percent and the national income approximates the 1939 level of 71 billion dollars?

2. What will be the effect if tariff rates are *increased* 50 percent and the national income approximates the 1939 level?

By PORTER M. HEDGE
Washington Correspondent for The Soybean Digest

3. What will be the effect if *no changes* are made in tariff rates and the national income approximates the 1939 level?

4. What will be the effects if the national income is 75 percent *higher* than in 1939?

Printed copies of the report will not be available for several weeks. Charles E. Lund, chief of the Commerce Department's Fats & Oils Unit, paraphrases the commission's findings thus:

Generally speaking, the upward or downward movement of tariff rates should not greatly affect domestic fats and oils, except flaxseed, considered a limited crop under normal conditions because of competition from others such as wheat.

Lund says the Tariff Commission's study indicates that with an income level 75 percent higher than 1939, prices of lard and cottonseed oil would tend to decline because of increased supplies due to heavier consumption of pork and cotton products. Such a decline in price should not attract imports, even if tariff rates were lowered.

With a high income level, demand probably would decrease for soybean oil because of a tendency to buy other oils and fats, such as peanut, cottonseed, corn oil and lard.

Should the relatively "low" 1939 level of income prevail, domestic demand for edible fats and oils probably would not maintain prices at a sufficiently high level to attract imports of truly competitive, foreign fats and oils.

Regardless of the income level, the United States should be able to export soybeans after the war, because of transportation advantages over the Chinese, principal foreign competitor.

Because of technically improved processing facilities, soybean oil should continue to supply a larger portion of the total volume of edible oils consumed domestically, especially in competition with palm oil and the lauric oils.

Lowering tariffs might result in greater imports of industrial oils such as copra and tallow, which Lund does not consider truly competitive with soybean oil.

A national income 75 percent higher than 1939 probably would increase domestic consumption of fats and oils by around five percent—from 6.9 million pounds to 7.1 million pounds—compared with 1939.

Up Budget For Disease

Aroused by reports of losses in soybean production from leaf diseases and bud blight last year, Congress has appropriated $70,000 for development of control measures by the Department of Agriculture's Bureau of Plant Industry.

The appropriation is double that of last year. The new funds were recommended

by Bureau of the Budget following a survey of USDA plans for fighting soybean diseases, and at the urging of the American Soybean Association.

In urging the increase, Rep. Malcolm Tarver of Georgia, chairman of the House Appropriations agricultural subcommittee, told Congress it was "fully justified as a war security measure.

"The losses from these diseases are on the increase and threaten the production of this vitally important wartime crop, the acreage devoted to which has increased from 3,500,000 acres in 1930 to more than 15 million acres, with an annual production of 500 million dollars."

Tarver said losses from leaf diseases and bud blight in 1944 amounted to more than 11 million bushels of soybeans, with individual yields cut as much as 50 percent.

The $70,000 appropriation will be available for 1945-46 fiscal year operations. Bureau of Plant Industry is drafting plans for expanding its control activities in line with the increased funds.

Prospects Improve

An unpublished study of 1945 planting intentions based on AAA farm plans as of April 16 indicates a national acreage of soybeans for beans of 11,361,000 acres — eight percent over 1944 and six percent above the 1945 acreage goal.

This compares with the March 20 published estimate by the Bureau of Agricultural Economics of 10,334,000 acres of soybeans for beans, and reflects generally improved acreage prospects during the month.

Here are the April farm plan estimates in thousands of acres:

State	Indicated 1945	Acreage 1944	Percent of 1944
New York	12	14	86
New Jersey	13	13	100
Pennsylvania	39	34	115
Illinois	3774	3400	111
Indiana	1431	1403	102
Iowa	2065	2129	97
Michigan	131	110	119
Minnesota	373	263	142
Missouri	903	606	149
Nebraska	32	27	119
Ohio	1255	1321	95
South Dakota	17	12	142
Wisconsin	83	49	169
Delaware	41	34	121
Maryland	37	35	106
Virginia	69	63	110
West Virginia	2	2	100
North Carolina	216	196	110
Kentucky	78	60	130
Tennessee	72	72	100
Alabama	62	47	132
Arkansas	234	233	100
Georgia	12	13	92
Louisiana	38	29	131
Mississippi	81	92	88
Oklahoma	11	6	183
South Carolina	9	12	75
Texas	5	2	150
Kansas	269	221	118
North Dakota	8	4	200

To Move Soy Flour

Approximately 100 million pounds of soy flour which War Food Administration has had on hand for many months is now scheduled to be moved overseas in Lend-lease and European relief programs, the *Digest* learned this month.

Bulk of the flour will go to Russia through Lend-lease, it was learned, and a small allocation has been made to UNRRA (United Nations Relief & Rehabilitation Administration).

While the full 100 million pounds has been scheduled for shipment, it may take

several months to move overseas.

France is reported to be taking considerable amounts of whole soybeans, partly through Lend-lease and partly by direct purchase, though quantities were not available.

Food Board Members

U. S. membership on the Combined Food Board which makes basic determinations on the division of food supplies available from the United States, Canada and Great Britain has been revised by D. A. Fitzgerald, new chairman of WFA's food requirements and allocations committee.

Walter C. Berger, head of AAA's feed management division, has been made chairman of the feeds committee responsible for feed requirements and allocations. William McArthur, head of the Grains Division of Commodity Credit Corporation, is alternate member on the feeds committee, and chairman of the grains committee.

PUBLICATIONS

COMPARISON OF MOLASSES-SOYBEAN SILAGE AND CORN MEAL-SOYBEAN SILAGE AS FEEDS FOR THE MILKING COW, by Willis A. King, Bulletin 713, New Jersey Agricultural Experiment Station, New Brunswick, N. J.

Molasses-soybean and corn meal-soybean silages were compared with corn silage in a 15-week feeding trial. The soybean silages were found to be palatable, the corn meal-soybean silage being equal to if not superior to corn silage in that respect.

Under the conditions of this experiment, no significant differences in economy of milk production were found between the soybean silages and corn silage when fed as a part of a complete ration. Based upon the milk production of the cows fed the corn meal-soybean silage, the total digestible nutrient content of this silage was lower than had been expected from calculations made at the beginning of the experiment.

When the soybean silages were fed in large amounts they replaced very satisfactorily all the corn silage, part of the hay, and all of the protein concentrate in the grain mixture. The protein of the soybean silages appeared to be adequate for the milking cows.

When the average cow is producing 25 or more pounds of milk daily, it was found to be impractical to feed corn meal-soybean silage with hay in a program of feeding roughage only.

Coefficients of digestibility and the metabolizable energy of corn meal-soybean silage and molasses-soybean silage were determined. The addition of corn meal to the soybeans as a preservative did not increase the total digestible nutrients of the resulting silage as much as had been expected. This observation, linked with that of lower milk production in the feeding trials, indicates a loss of about 10 percent of the nutrients of the corn meal.

The molasses-soybean silage was less digestible and contained less metabolizable energy when fed alone than when fed with hay and grain.

In The MARKETS

• SOYBEAN STOCKS. April 1 farm stocks of soybeans are estimated at 27,852,000 bushels or about 14 percent of the 1944 production. These stocks are substantially lower than last year when the April 1 stocks amounted to 39,876,000 bushels or 21 percent of the 1943 production. On April 1, 1943, the first comparable period for which data are available, farm stocks were estimated at 54,350,000 bushels or 29 percent of the 1942 production. In most of the major producing states, farm stocks are less than for the same date last year. Current stocks are above April 1, 1944, however, in a few of the non-commercial states where soybeans are largely held for feed and seed and where feeding requirements have not been as heavy as anticipated.

Disappearance of soybeans from farms during the first quarter of 1945 was smaller than for the same period last year, totaling 14,741,000 bushels compared with 17,457,000 bushels in the first three months of 1944. This decreased disappearance was expected as the crop moved to market faster during the first period October through December than for the same period of the 1943 crop movement. Maturing and harvesting conditions last fall were almost ideal in nearly all of the major producing states and the crop moved from the farm as rapidly as transportation and storage facilities became available. Since government price regulations were in effect there was little incentive to hold for higher prices, especially in the commercial areas.

Approximately 19½ million bushels will be needed to plant the prospective 1945 acreage for all purposes. Nearly 13 million bushels of this amount are likely to be used on farms where grown. However, current farm stocks in several of the Southern states are low and it is possible that less than the usual amount of homegrown seed will be used on farms. This would necessitate larger than usual amounts being purchased for seed, if the prospective 1945 acreage is planted.

SOYBEAN STOCKS ON FARM APRIL 1 (1,000 Bu.)

STATE	1944	1945	STATE	1944	1945
Maine	—	—	South Carolina	29	21
Vermont	—	—	Georgia	28	24
New York	213	71	Kentucky	197	195
New Jersey	146	87	Tennessee	199	146
Pennsylvania	233	148	Alabama	121	75
Ohio	5,494	3,818	Mississippi	324	276
Indiana	4,932	4,167	Arkansas	380	506
Illinois	11,974	8,568	Louisiana	123	87
Michigan	702	399	Oklahoma	25	12
Wisconsin	559	368	Texas	21	1
Minnesota	797	781	Montana	—	—
Iowa	9,628	5,110	Idaho	—	—
Missouri	1,478	1,273	Wyoming	—	—
North Dakota	19	14	Colorado	—	—
South Dakota	89	34	New Mexico	—	—
Nebraska	151	48	Arizona	—	—
Kansas	394	431	Utah	—	—
Delaware	190	178	Nevada	—	—
Maryland	172	155	Washington	—	—
Virginia	296	236	Oregon	—	—
West Virginia	14	6	California	—	—
North Carolina	948	617	United States	39,876	27,852

• EXPORT DEMAND. Exports of fats and oils from the United States to Europe remained large for six years after World War I, reports Bureau of Agricultural Economics. Average exports in 1920-24 of lard, oleo oil, cottonseed oil, and shortening were 887 million pounds annually, 19 percent over the 1910-14 average. The average annual value of these exports was 125 million dollars, 71 percent over the 1910-14 average. Exports of lard were especially large, averaging 710 million pounds annually, 64 percent more than the 1910-14 average of 433 million pounds.

European demand for fats and oils from the United States probably will continue strong as long as Far Eastern oils and oil-bearing materials are available only in restricted quantities. Demand for lard and soybeans may be especially strong. As during World War I, hog numbers in Europe have been greatly reduced from the pre-war level, and a few years probably will be necessary to rebuild herds. Also, as long as Manchurian soybeans cannot be imported into Europe, soybeans from the United States will be sought for both their oil and their meal content. High-protein feeds for restoring production of livestock products will be needed.

Strength of European demand for U. S. fats and oils in the longer term after the war will depend partly on availability of dollar

exchange. This, in turn, will depend in part on the amount of credit that may be extended to European countries in the early post-war period, as well as on the volume of dollar exchange obtained by sale of goods and services to the United States. In the past three years substantial dollar balances have been built up by foreign countries. It is possible that after the most urgent need for relief has passed, however, a large share of available dollar exchange may be used for the purchase of industrial equipment, leaving a relatively restricted amount free to pay for imports of food items.

• SOYBEAN STOCKS. War Food Administration commercial grain stock report.

UNITED STATES SOYBEANS IN STORE AND AFLOAT AT DOMESTIC MARKETS (1,000 Bu.)

	April 10	April 17	April 24	May 1
Atlantic Coast	523	561	719	425
Gulf Coast	669	920	946	697
Northwestern & Upper Lake	602	602	602	511
Lower Lake	4,933	4,402	3,952	3,527
East Central	5,136	4,467	4,650	4,425
West Central, Southwestern & Western.	4,040	3,871	3,732	3,515
Pacific Coast				
Total current week	15,903	14,823	14,601	13,100
Total Year ago	12,215	11,505	11,293	10,785

TOTAL NORTH AMERICAN COMMERCIAL SOYBEAN STOCKS (1,000 Bu.)

Current week	15,903	14,823	14,601	13,100
Year ago	12,226	11,515	11,298	10,790

• FLAXSEED PRODUCTION. World production of flaxseed dropped to about 132 million bushels in 1944, after reaching an all-time high of 200 million bushels in 1943, reports *Foreign Crops and Markets.* This is the smallest outturn since 1929, when only 132.6 million bushels were produced. Countries of the Western Hemisphere, now the major producing ones, harvested crops much smaller than those of 1943. The sown acreages were smaller in the United States, Canada, and Mexico; Argentina's sown acreage, however, was about average. The small harvest in that country was attributed to the drought that prevailed throughout the planting and growing season. Uruguay's harvest was the largest since 1939. India's 1944 flaxseed crop was below normal, although it compared favorably with the two previous years. According to unofficial reports, European production was somewhat larger than that of pre-war years. Morocco and Egypt have about trebled their production during the past seven years.

Despite the short crop of 33 million bushels just harvested, Argentina still holds first place in flaxseed production and may become the largest consumer if the fuel-oil shortage continues.

• SOYBEAN INSPECTIONS. Inspected receipts of soybeans in March showed considerable increase over those for February, according to inspectors' reports to the Grain Products Branch of the War Food Administration. March inspections totaled 3,848 cars compared with 2,367 cars in February. Inspected receipts for October-March this season were 62,000 cars compared with 70,096 cars for the same period the preceding year.

The quality of the soybeans inspected in March also was some-

what higher, 88 percent grading No. 2 or better compared with 83 percent in February.

Inspections of soybeans in March included the equivalent of about 186 cars inspected as truck lot receipts.

• FATS USED IN MARGARINE. Use of fats and oils in margarine in 1944 totaled 479 million pounds, compared with 500 million pounds in 1943, reports the Bureau of Agricultural Economics. Specific authorization continued to be required in 1944, under War Food Order 29, for use of cottonseed, soybean, corn, or peanut oil in margarine as well as in other fat products.

Cottonseed oil was the leading margarine oil in 1944, as in every year since 1936. But use in margarine was reduced to 215 million pounds from 252 million pounds in 1943. *Use of soybean oil increased to 211 million pounds from 198 million pounds a year earlier. Together the two oils comprised 89 percent of the fats and oils used in margarine in 1944.*

The principal minor margarine oils and fats in 1944 were peanut oil, oleo oil, corn oil, and neutral lard. Use of imported fats and oils was limited to about 1,000 pounds of sunflower oil. Lauric acid oils (including coconut and babassu) and palm oil have been reserved since early 1942 for war uses such as synthetic rubber and tin and terne plate, and for manufacture of soap and glycerin.

Use of cottonseed oil in margarine in 1945 probably will increase in relation to use of soybean oil, because production of cottonseed oil is expected to increase this year while output of soybean oil may be about the same as in 1944. Little, if any, imported oil is likely to be available for margarine in 1945.

• MARCH FOOD PURCHASES. WFA's report of agricultural commodities purchased during March for lend-lease, territorial emergency, Red Cross and other purposes.

Commodity (Lbs.)	March	Jan. 1 Thru March 31, 1945
Margarine	5,331,908	17,458,221
Shortening	30,288	141,332
Vegetable Oils	351,164	58,416,540
Soybeans	2,876,000	4,875,100
Soy Flour & Grits	1,634,370	8,494,150
CASH SALES		
Margarine	865,256	1,883,797
Salad Dressing	381	18,336
Shortening	889,170	2,223,066
Vegetable Oils	5,361,370	5,423,980
Soy Flour	5,551,500	6,225,000
Soy Grits	79,400	207,900

• STANDARD SHORTENING SHIPMENTS. By members of Institute of Shortening Mfgrs., Inc.

April 7, lbs.	7,665,503
April 14	9,114,745
April 21	8,019,568
April 28	9,294,178

Government Orders

• FATS AND OILS QUOTAS REDUCED. After a survey of the available supply of fats and oils by the Inter-agency Committee, it has been found necessary for the War Food Administration to reduce raw material quotas for the manufacture of edible oil products (margarine, shortening, cooking and salad oils) and soap for consumption by United States civilians.

The reductions, effective for the second (April-June) quarter, are made by amendments to War Food Orders 42 and 42b under which the manufacturers' use of fats and oils is regulated.

The new fats and oils quotas for the second quarter are:

For margarine — 110 percent (instead of 120) of the quantity used in the corresponding calendar quarter of 1944.

For shortening, cooking and salad oils — 80 percent (instead of 83) of the average quantity used in these products during the corresponding calendar quarters of 1940 and 1941.

• HAULING CHARGE. Soybean processors who make deliveries in their own trucks may add a hauling charge to their ceiling prices for these deliveries, the Office of Price Administration says.

The delivery allowance is three cents per 100 pounds for the first five miles, plus one cent for each additional five miles up to 100 miles. This limits the hauling charge to 22 cents per 100 pounds for processors' deliveries.

A similar allowance is already in effect for wholesalers' and retailers' deliveries, OPA said.